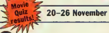
POPULAR Computing WEEKLY

Only 50p.



20-26 November 1986

Vol 5 No 47

Commodore's new Amigas revealed

Details on page 4



FEATURES

Tandy 1000EX: low cost PC compatibility

Screenvision – turn your monitor into a TV



THE HARDWARE BUYERS' GUIDE

The 'Big Ten' machines: which would suit your needs best?

What you can get from a PC compatible

Games consoles and bargain micros



20–26 November Contents

Editor Christina Erskine **News editor** John Lettice **Features editor** John Cook **Technical editor** Duncan Evans **Production editor** Michelle Beauchamp **Supplements editor** Christopher Jenkins **Supplements designer** Barbara Hajek **Advertisement and Promotions manager** Simon Langston **Assistant advertisement manager** David Osen **Advertisement executive** Jon Beales **Classified executive** Rodney Woodley **Editorial secretary** Annmarie O Dwyer **Administration** Geraldine Smyth **Managing editor** Peter Worlock **Publishing director** Jenny Ireland **Published by** Sunshine Publications Ltd 12 13 Little Newport Street London WC2H 7PP Tel 01 437 4343 Telex 296275 Fax 01-439 0681 **Typeset by** Magazine Typesetters 6 Parnell Court, East Portway Andover Hampshire **Printed by** McCorquodale Magazines Andover, Hampshire **Distributed by** S M Distribution London SW9 Tel 01-274 8611 Telex 261643

ISSN 0265-0509

Popular Computing Weekly. Tel: 01-437 4343.

ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles and any accompanying programs should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work

Amstrad – plans for 1987

AMSTRAD is planning improvements to its current range of computers to be launched towards the end of next year.

Chief among the forthcoming products are new versions of the PC1512 range and a follow-up to the PCW range.

Amstrad hopes that the new PC clones will be even cheaper than the 1512s and is planning to achieve this by designing many of the components in house, rather than using existing third party components particularly with the hard disc versions.

"Amstrad is looking to design its own components and while this would be a departure for the company, it is a concept which needs to be looked at very closely," said an Amstrad spokesman.

The new word processing micro is due to be released towards the end of 1987. Amstrad would give no details about the machine but it would appear that it will take the form of a substantial redesign and upgrade – both hardware and software – to the existing machine.

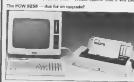
"Given the success of the PCW range there is no question of us saying that's it. Their sales warrant further examination of the range," the spokesman continued.

At the lower end of the market Amstrad is concentrating on the Spectrum Plus 2 to cater for the games playing sector and has not ruled out the possibility of price-cutting in the face of potential competition from the forthcoming games consoles.

"The Plus 2 is currently competitively priced but if market conditions changed then we would look at that option," concluded the spokesman.

Of course if games consoles were to take off in a big way, as Atari certainly believes is on the cards, Amstrad could compete in that market by producing its own.

The PCW 8256 — due for an upgrade?



New Amigas – further details

FURTHER details are now becoming available about Commodore's new Amiga machines (see *Popular Computing Weekly* September 18) which will eventually replace the current A1000 model.

Top of the range is the A2500. Upwardly compatible with the existing Amiga it will have one megabyte of Ram and will continue to use the 68000 processor, not the more advanced (and more expensive) 68020 as was first hoped. No hard disc will be included to help keep the price down.

The A2500, which is being manufactured in Germany rather than the Far East, will also accept up to seven Amiga and IBM plug-in cards – for extra Ram, second processor and custom boards. Commodore is producing an IBM emulator for the machine which will be its equivalent of the A1000's Sidecar. The A2500 is expected to cost around $1400 (around £1000) but in UK will almost certainly be more expensive than its direct dollar equivalent.

The second new Amiga is the cut-down model and is to be aimed in direct competition with the Atari ST to be priced at around £500. It will have a built-in $3\frac{1}{2}$ inch disc drive with the PCB contained in the keyboard case. Memory is likely to be 512K, expandable to eight megabytes.

The A2500 is scheduled for launch in the US early next year with the cheaper version two or three months later.

No details of availability in the UK are ready, a spokesman for Commodore UK commented, "We have no launch date yet and no firm plans. The new Amigas will be here in due course."

● The court case between Commodore and Atari over the Amiga machines (see *Popular Computing Weekly* September 18) which was due to be heard this month, has been postponed until March.

Atari goes public in US

THE Atari Corporation is currently raising money to pay for expansion, and a determined effort to raise its profile as new Atari machines are due to be launched at the beginning of next year.

Chairman Jack Tramiel has sold 4.5 million blocks of Atari treasury stock at $11.5 per share raising $52 million for the company. Jack Tramiel and his son Sam, Atari's president worldwide, still however own well over 50% of Atari.

"At the moment it's just a one-off sale," said Atari UK's boss Bob Gleadow. "Tramiel isn't going to the bank to borrow money, rather he's making an offer to the public. The money will be used to expand our activities – there are quite a few new products in the Atari pipeline."

Gleadow confirmed that the long-awaited Atari 520STFM (with a built-in disc drive and TV modulator) would be available from January onwards. "It's now definitely in production and on its way," he said.

Second of new Atari products next year is the (equally long-awaited) 7800 games console (see *Popular Computing Weekly* November 13). Atari is convinced that the games console is due for a comeback.

"We can see a distinct separation in price between computers and video games machines," Gleadow continued. "The 7800 will be substantially lower in price than the 130XE, close to £80 and, of course, it can use 800, 130 and 2600, the previous games console's software."

Sir Clive Sinclair is alive and kicking

SIR Clive Sinclair may not be in the public eye so much these days but he is still very much involved in the market.

The founder of Sinclair Research has set up two companies since selling all his Spectrum and QL rights to Amstrad. The first, Anamartic, is working on research into wafer scale integration (see *Popular Computing Weekly* July 17).

The second company is Moduliser, based in Cambridge and working on development of Pandora, the portable computer project which Sir Clive retained after the Amstrad buy-out.

Pandora will no longer be Spectrum compatible (this would run against the terms of the deal struck with Amstrad) but will run CP/M and the flat screen display has also been abandoned.

Moduliser, which is headed after Sir Clive by former Sinclair Research directors Jim Westwood and Dave Chatten, hopes to launch the portable at February's *Which Computer?* Show.

Third party support grows for PC1512

THE Amstrad PC continues to attract support even though the machine itself is something of a rarity

The latest developments include software printers, and special offers from the new user group

The software is *Tasword PC* an upgrade of Tasman's best selling word processing package on the Spectrum Amstrad CPCs, and the Amstrad PCW machines

Apart from the usual word processing facilities, *Tasword* includes a data merge feature which allows addresses and other information to be automatically included in your documents At £24 95 it is one of the cheapest packages but *Tasword* may find the going tougher in this market than in its earlier incarnations

Extra printer support is offered by Brother through retailer Wilding Office Equipment Buy your Amstrad PC from Wilding s and you can get a cut-price printer at the same time

The models covered by the offer are the HR-20 daisy wheel, for £400, the 1509, 1409 and 1109 dot-matrix machines for £500, £400, and £200 respectively

Further support comes in the form of the 1512 Independent User Group

Its first discounts are a half-price copy of the *NewWord 3* word processor and a 20Mb hard disc on a card for £400

Membership costs £20 per year Details from 09592 4955 or 09592 2595

Trivial Pursuit – more questions

DOMARK has announced the release of extra questions for its highly successful micro implementation of *Trivial Pursuit*

The first set available is the *Young Players Edition* which can be bought either as a full *Trivial Pursuit* game for £14 95 or for those who have already bought the micro version, as a cassette of supplementary questions for £7 95 The *Young Players' Edition* contains two sets of questions one for seven to 12 year olds the second for 12 years and over The package comprises around 3,000 questions in all

Further packs of extra *Genus Edition* questions – *Genus II* – and a *Baby Boomer* question tape will be released around Christmas probably early next year

The stand alone extra question packages are not micro specific and will load into any computer *Trivial Pursuit* is currently out on Spectrum Amstrad CPCs and Commodore machines while Amstrad PCW IBM PC and Atari versions are due out shortly

Orbix the Terrorball

● Domark has also released the first game of a new label – Streetwise The Streetwise label will concentrate on arcade games, and with *Orbix the Terrorball* you must rescue a stranded space crew from within the Orbix space ball which you must control as it bounces around the screen

Available initially for the Spectrum *Orbix* costs £7 95

Software Hotlines

It s not often this zany world of home computing gets a look in on the airwaves of Radio 1, but **Code Master's** *Mr Angry* did – as disc jockey Steve Wright uses a character of the same name in his afternoon show

Although there was a bit of a hoo ha at the time all has ended happily with the game retaining its title – they probably threatened to change the name to Mr Politically Biased

There s nothing that the software houses won t do for us computer magazines Usually the early weeks of January are very lean times for us Journos – as nothing is ever released after Christmas Not this year though, as product after product has its release date set back The latest benefactor is Firebird who announced this week that it won t be launching *Cholo* until after the festivities

Steve Interesting Wilcox of **Elite** isn t silly, though He s proved that *Space harrier* is going to be out on time by sending us some nice screen shots (Spectrum version below) Now then It looks just that in the arcades Really

Ever fancied running a software distribution company!' chirps the introductory blurb of **A&F** s *Wibstars* Are they kidding? Have you ever seen these sinister Shylock type characters sucking their profits from the very life blood of the Working Classes (ohoops – bit of political bias there)

Good news for Joyce PC and ST owners, as **PSS** seems to be starting to produce its Wargamers Series for these machines, as well as the usual Spectrum/Commodore 64/CPC formats *Annals of Rome* is the latest offering, which has all the makings of a strategy classic as you guide the fate of the Roman people (expansionist imperialist dogs) from 273 BC Out late November, excepting CBM, PC and ST versions which will arrive in the spring

Annals of Rome

The latest Audiogenic press release (always a glittering ray of sunshine in the usual banal haze of blurb – thanks to well – weird Henry Smithson) concerns a heart-rending story of *Psycastria* programmer Gary Partle (aged 19) and his (now ex) fiancée, Tracey Large scrolling declarations of love had to be excised from the game, lest they torment the lad to his grave Hopefully this will put an end to those yukky dedications Take my advice lads – say it with freesias

Finally the search for Lever and Jones goes on (see Hotlines Nov 13) Where are the zany duo? Who knows? Who cares?

See you next week Pop Pickers

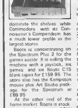
John Cook

Amstrad dominates Christmas shopping



THE main High Street chain stores have noticeably reduced their computer ranges for the Christmas selling period

Amstrad machines will



dominate the shelves while Commodore with its Connoisseur's Compendium has a much lower profile in the largest stores

Boots is concentrating on the Spectrum Plus 2 for the games sector It is selling the machine with a joystick, six games and six Boots C15 blank tapes for £159 95 The store also has the Kempston mouse plus Art Studio package for the Spectrum at £69 95

At the other end of the home market Boots is stocking the Amstrad PCW 8256/8512 at their usual prices of £458 85 and £573 85 respectively

Commodore's only presence in Boots will be through a Boots exclusive Compendium which comprises the old style 64 C2N tape deck, joystick Currah speech synthesiser Trojan light pen a programming book, five games and six blank tapes – all for £199 99

W H Smith is stocking Amstrad products exclusively the CPC 464 and 6128 PCWs 8256 and 8512 and the Spectrum Plus 2 The Spectrum Plus 2s are selling very well indeed John Rowland Smith's merchandise controller commented W H Smith is not however selling the Amstrad PC

Rowland feels that the Commodore Connoisseur's Compendium containing the 64C is too expensive However he says, We are selling off some old 64s in Music packs

The John Lewis Group is stocking the full Amstrad range from the Spectrum Plus 2 up to the PC1512 range The group is still uncertain about Commodore's computers and is not stocking any from Atari Lasky's is selling two versions of the Spectrum Plus 2 – in a joystick plus six games bundle for £159 99 and the computer on its own at £149 99

Lasky's has one of the wider ranges this year with the BBC Master 128 at £499 99 and the Master Compact at £459 99 Amstrad's 6128 in both colour and black and white versions the PCWs and single disc versions of the PC1512 It also has the Commodore Connoisseur's Compendium at £249 99

Finally Dixons is also going for a wide range and has a number of older computers at special offer prices the Atari 800XL plus joystick software and a data recorder at £69 99 the Electron with software and a data recorder at £79 99 the Spectrum Plus software data recorder and joystick at £109 99 the Spectrum 128 with a similar pack at £139 99, and the QL at £119

Of the newer machines its Spectrum Plus 2 comes with a 10 pack of software and a joystick for £159 99 It is also stocking the CPC464 and 6128 the PCWs and of course the PC1512s

Dixons is selling the Commodore 64C at £249 99 and selected branches have the Acorn Master Compact

For further details of computers available this Christmas turn to our Hardware Buyers Guide which starts on page 23



Microprose at Commodore show

THE 9th Official Commodore show, in the words of the organiser Database is shaping up to be quite a big event with more than 70 exhibitors expected to be in attendance including for the first time US simulation experts Microprose

A popular feature of the last show the Amiga Village will be making a comeback showing all the latest developments on the 16-bit front

Other attractions include regular question and answer forums over all three days run by the Independent Commodore Products User Group and a separate special area devoted to computer generated music

Interested parties (and there were over 20 000 last time) should make their way to the Novotel Hotel Hammersmith between November 21–23 10am–6pm (4pm on Sunday) and have ready £3, or £2 for under 16s

'Waggle' test for Konix Speed King

PERIPHERAL manufacturer Konix is running a competition open to everyone to promote its Speed King joystick

People are invited to guess the strength and resilience of the Speed King, judged by a test devised by Konix

The company intends to hook the joystick to a machine which will emulate the moves needed to reach qualifying standard in the 100 metres event in Ocean's *Daley Thompson's Decathlon* game

Rather than stopping after 12 seconds or so however the machine will continue to waggle the joystick until it breaks This test will take place in early February 1987 and entrants are simply required to estimate how long the joystick will last

Further information about the competition can be obtained from Konix, c/o Solution Public Relations 2 Wellingtonia Court Varndean Park Brighton BN1 6TD which is also the entry address The closing date for entries is January 31 1987

US for Piranha

PIRANHA the games software arm of MacMillan Publishing is set to launch in the US through Spinnaker Software

Spinnaker has acquired the rights to *Strike Force Cobra*, and plans to release it in time for Christmas

According to Piranha's publishing director Tony Feldman, Spinnaker is also keen to take *Rogue Trooper* and *Nosferatu the Vampyre* on board We expect those to be in the US market by early spring

Product News

Organiser booked



EXISTING – or potential – owners of the Psion Organiser will no doubt be interested in a new book from Kuma

It s called *Using and Programming the Psion Organiser II* and the title just about says it all Price is £9 95

It should be available from good bookshops but failing that you can contact Kuma on 07357 4335

Atari ST Space Shuttle

MICRODEAL s latest package for the Atari ST, a machine the company is strongly supporting is *Space Shuttle*

Space Shuttle is a simulation with you as the astronaut

It costs £24 95 and should be available now Details from Microdeal on 0726 68020

Training for the PCWs

NEW training courses are being set up for PCW 8256/8512 users by Amstrad Distribution

Under the aegis of Amstrad Distribution s training consultant Roy Curtis, trainees will spend one day at the company s Newcastle Under-Lyme being taught about both the PCW s hardware and software Numbers are limited to six per group

Amstrad Distribution is also planning to launch an Advanced Amstrad User Course to begin next year

The current training course costs £79 which includes lunch and refreshments further details can be obtained from Amstrad Distribution, PO Box 299 Newcastle Staffs ST5 7QS (0782 6100110

NewWord safe with New Star

FOLLOWING the takeover by Micropro of New Star products in the US the companies respective British arms are finalising agreement over which will sell which product in the UK

New Star (UK) currently supplies products such as *NewWord* on CP/M and PCDOS formats After February 1987 however, Micropro (UK) will take over selling the PCDOS versions, while New Star will continue supply and support for the CP/M implementations

New company to sell on mail order

VONSOFT, a newcomer to entertainment software is to promote its first game, *The Great Arena Challenge* with the temptation of a cash prize for the first person to solve a question posed about the gameplay

The cash prize comprises a lump sum plus 50p for every copy sold There is £10 000 for the prize in the bank now said Trevor Dowie of Vonsoft

Vonsoft has some grand-scale plans for its launch into the games market – 20 releases next year at two price points of £2 99 and £4 95 *The Great Arena Challenge* belongs to the latter category All titles will be sold on mail order

Further details from Vonsoft, 5 Knockholt Road, Halstead near Sevenoaks Kent TN14 7ES

NB Cash prizes for computer games are nothing new but they have met with varying success Domark established itself as a software company with *Eureka!* (£25,000 up for grabs), but Haresoft with its prize of a golden jewelled hare ornament for its game, failed to capture the public s imagination

Mac programs for the ST

ADD ON manufacturer Robtek claims it will be shipping its controversial *McEmulator* by the time you read this

For £170 the gadget will allow you to run software for the Apple Macintosh on your Atari ST

Why this should be controversial is unclear, since Robtek says no problems are expected from Apple

Contact Robtek at Unit 4 Isleworth Business Complex, St Johns Road, Isleworth, Middx (01-847 4457)

Diary Dates

NOVEMBER

21–23 November
The Commodore Computer Show
Novotel Hammersmith London W6
Details Hardware software and peripherals for the Commodore range of computers
Price £3 adults £2 children £1 discount for advance booking
Organiser Database Exhibitions 061-456 8835

22 November
6809 Show
Old Halls of the Royal Horticultural Society
Details Show for the Dragon and Tandy Colour Computers
Price £2 50 adult £1 75 children, reduction for advance purchase
Organiser Jenny Pope Microdeal 0726 68020

28–30 November
The Atari Christmas Show
New Horticultural Hall Greycoat Street Westminster London SW1
Details Hardware software and peripherals for the Atari range of computers
Price £3 adult £2 children £1 discount for advance booking
Organiser Database Exhibitions, 061-456 8835

29 November
Wight Computing Fair
Ryde Town Hall Ryde IoW
Details Local show covering wide range of subjects
Price N/A
Organiser Wight Computing Users Group 10 John Street Ryde Isle of Wight PO33 2PY

FEBRUARY

17–20 February
Which Computer? Show
NEC Birmingham
Details Mainly business exhibitors, includes Commodore and low cost PC clones
Price £5
Organiser Cahners Exhibitions 01-891 5051

Prices dates and venues of shows can vary and you are therefore strongly advised to check with the show organiser before attending *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

Letters

I am not totally sexist...

I am sure that women, with their much envied multi-tasking abilities could easily equal men in numbers of computer hobbyists/programmers given sufficient enthusiasm

However, it takes concentrated singular effort to meet each challenge in computing and generally men are more prone to rising to challenges

I would suggest that women who wanted to succeed in computing would do so but they would not likely be of the category that would take offence, or would be put off by knowledge of the existence of two or three male orientated games/cassette covers

Programmers need to be single-minded, not narrow minded I mean no offence to your correspondent I am not totally sexist and microchips are definitely hermaphrodite!

George Payne
Bushey
Herts

...and I'm still fighting

In reply to your Ziggurat of *Popular* October 23 entitled Where are the Women Users?, I can assure you that we are here fighting away at the system (and hitting our heads against many a brick wall on the way)

I have young children at school and might have expected that this would give me an ideal opportunity to re-educate myself into the computer field (mistake number one)

I wrote to every college within travelling distance, but all the courses were full-time and did not finish until 5 00 pm impossible for picking up my children from school I eventually got on to a manpower services course in Information Technology which taught me the basics, and I took an EMFEC II certificate in computer programming So far so good

I had now been well and truly bitten by the bug and as my tutor said I had potential and must not give up now. I once again began the endless round of telephone calls The best I could come up with was a night-class in City and Guilds Cobol programming (and me with all that useful time to spare during the day!) The first three weeks saw us with a lecturer who did not know Cobol, and when we eventually got someone who did he said that he did not think we would have the time to put in enough work to take the exam and I am only on the course to get a qualification

Despite everything I am still fighting and I hope to get a job in the industry but when you have to push so hard to get anywhere there must be many casualties on the way and can you blame them? It should not be made so impossible for women with responsibilities to their families to re-educate themselves into computing

Vicky Easton
Market Harborough

No Sony MSX 2 here

I refer to the recent correspondence from Peter Nijs of Belgium (*Popular* October 16) in which he describes the Sony MSX 2 computer I would be grateful if Mr Nijs would write to me at the address below with the model number and full details of this computer, for as a dedicated MSX user (Sony Hit Bit) I would dearly like to purchase the Sony MSX 2 described

Steven Potts
10 Lemon Close
Liverpool L7 5QU

One word of caution, Steven. As the Sony MSX 2 is not available in the UK, you will need to hook it up to a monitor rather than a TV as the TV standards are different, and you will need a transformer to deal with the power supply.

Stabilising the jellies

Thank you for your recent letter concerning my program Wobbling Jellies, for the 128 Spectrum which you printed in *Popular* September 25

There are some bugs in the program which can be corrected as follows

Change line 50 from

```
50 FOR t = 0 1 TO 7 STEP (7/13)
```

to

```
50 FOR t = 0 1 TO 7 STEP (7/12)
```

Then change line 270 from

```
70 NEXT h
```

to

```
70 NEXT i
```

I have now thoroughly tested the new version and it appears to work correctly

M D Lancaster
Hounslow
Middlesex

Booking into QL

I wonder if you or any of your readers can assist me I have recently bought a Sinclair QL and serial 8056 printer which I am using with a Ferguson monochrome monitor I am very much an amateur computer hobbyist, therefore I find that the user guide supplied with the machine difficult to under-

Puzzle

Puzzle No 234

Jamie was making a list of the Fibonacci series This is the series of numbers beginning 1 1 2 3 5 8 13 21 and so on each subsequent number being the sum of the preceding two

Jamie noticed that the fifteenth number in the series was an exact multiple of ten the number being 610 and this set him to wondering if there are any higher numbers which are multiples of 100 and 1000

He soon found that the numbers rapidly became too large to calculate their complete value but he was able to find the *position* in the series at which these two multiples would first occur

Can you find them? Note that we do not require the actual numbers – just their positions in the series!

Solution to Puzzle No 228

Answer A second sequence of primes will be formed from the digits 37199
37199 71993 19937 99371 93719

Solution Clearly the only digits that can appear on the cards must be either 1 3 7 or 9 As each card will be moved at some stage to the right-hand end of the row any of the other digits will result in a number that would be either even or divisible by five and would therefore not be prime

These four permissible digits are held in the array N(4) and are called by the five For/Next loops to create a sequence of five-digit numbers for testing The left hand digit is moved to the right-hand and a total of five times at each stage the resulting number is tested for primality in the subroutine If the number is prime the variable TAL is incremented by 1 If at the end of the test this variable is equal to 5 then each of the numbers will have been prime

This gives two sequences of digits 11939 and 37199

Winner of Puzzle No 229

The winner this week is Christopher Weber of Roath Cardiff who will be receiving £10

Rules

The closing date for Puzzle 234 is 8 December

```
>10 DIM N(4)
 20 N(1)=1:N(2)=3:N(3)=7:N(4)=9
 30 FOR A=1 TO 4
 40 FOR B=1 TO 4
 50 FOR C=1 TO 4
 60 FOR D=1 TO 4
 70 FOR E=1 TO 4
100 TAL=0:N$=STR$(N(A)*10000+N
(B)*1000+N(C)*100+N(D)*10+N(E))
110 FOR W=1 TO 5
120 N=VAL(N$)
130 GOSUB 1000
140 IF PP=0 THEN TAL=TAL+1
150 N$=MID$(N$,2)+LEFT$(N$,1)
160 NEXT W
170 IF TAL=5 THEN PRINT N$
180 NEXT:NEXT:NEXT:NEXT:NEXT
190 END
1000 PP=0
1010 FOR Z=3 TO SQR(N)+1 STEP2
1020 IF N/Z=INT(N/Z) THEN
PP=1:Z=N
1030 NEXT
1040 RETURN
```

stand and generally of limited value

Could you suggest any book titles which would be of help in learning SuperBasic programming?

My second problem is that I cannot get the printer to work outside the *Quill* software I would like to be able to print out home-brewed listings etc but I cannot even get the printer to work with the other Psion programs

Any forthcoming advice will be very gratefully received

H P M Keegan
Bristol

On the books front, look in computer sections of bookshops for Century Hutchinson's Sinclair QL series of titles, one of which is entitled *Introduction to SuperBasic on the Sinclair QL*. For general books on the QL micro, you can write to Sunshine Books, 12–13 Little Newport Street, London WC2H 7PF (sounds familiar?) for details on its range of QL titles

As for the printer problem, anyone got any suggestions?

I dream of Genie

Now that the former national Colour Genie Users Group has closed its premises perhaps you could let readers know that they and their friends with Colour Genies can obtain support and an international software range from my address 24 Glaisdale Thatcham Berks RG18 4XJ

Membership is free the only conditions being that you enclose an SAE with all correspondence and there must be no copying of software

A Ram-based phonetic speech system is available for all models (are we the first to do one for a 16K micro with 4K still free to Basic?) A tape magazine will be available from January 1987

Gerry Huggins
Berks (Colour Genie)
Users Group

Look it up in the dictionary

We would like to point out that due to what appears to have been a typographical error in our advertisement last week for *The Press* The compression abilities of the program have been greatly understated text can in fact be compressed by up to 50% not by only 15% as published in the ad

As a further point of interest we noticed in your description of the product in New Releases that the compression time can run from ½ hour to ten hours dependent on fast or slow mode The reviewer appears in fact to have missed the *Dictionary* option which allows you to use the general purpose dictionary provided with the program with which even a full size database can be compressed by some 40% in only two minutes The compile options are designed to allow this figure to be raised to 50% by generating a game specific dictionary

We feel this letter may help to clear up any misunderstanding occasioned by these errors

Howard Gilberts
Gilsoft International Ltd
S Glamorgan

The testing machine managed to score 2708335435 36 02552406425775320 before the joystick brake

The *Dictionary* option was not overlooked We concentrated on the "compile and compress" option because the documentation says it produces the better results

What price a conversion?

A lot of talk has been going on recently about the price of software that with the exception of budget software, sells in the region of £9–£10

Of course there have been complaints about the fact that software for the Amstrad and Commodore computers is very nearly always a pound dearer than the equivalent Spectrum product but here is what I think is another side of the argument

The example I m about to use and I m not being vindictive as I m sure that there are plenty of other examples concerns the fact that when Gargoyle Games released *Dun Darach* for the Spectrum at £10 a go, no-one complained saying what a fabulous piece of programming, graphic design etc that it was

Exactly the same comments were passed when the Amstrad version was released

Now you may think what s wrong with that? Well considering that the Spectrum version took around six months of development time that may well justify the £10 price tag but when you discover that the conversion form the Spectrum to the Amstrad took only a fortnight, how can a similar price tag be justified?

Of course Gargoyle may say that the Amstrad version is likely to sell less copies but then why wasn t the Spectrum version sold cheaper than it was?

I would be very interested to hear what Gargoyle Games have to say about the matter

Martin Joyce
Motherwell

Well, Martin, this is what Greg Follis of Gargoyle Games has to say: "The six month development time referred to was the time spent writing with two machines in mind With Spectrum and Amstrad the same type of coding is used

"The fortnight you say was the Amstrad conversion time lag between one version being finished and the other."

This will hold true for many conversions – frequently games are developed with all machines in mind, rather than entirely separately. Where conversions are fully rewritten, development time on the conversion can be just as long Besides, it would be decidedly odd if those who owned the original destination machine for a game had to bear all the development costs and pay the most

No such thing as collective genius

I have been following your Readers vs *Colossus* chess tournament with interest I am afraid it only confirms that there is no such thing as collective genius

You cannot expect the majority to simultaneously agree on a new innovative and sound move any more than you can expect a committee to have an idea Individuals can have ideas and collective groups then adapt and/or apply them

Brilliant chess players are few and far between good ones are rare and competent ones not that easy to find We players in the poor to bad category are very thick on the ground

Someone may well be sending moves of stunning ingenuity but these will be swamped by the rest Democratic chess simply means that you find the lowest common denominator

G J Edwards
Leeds

Point taken, but the idea of the *Popular* chess tournament was never to make Kasparov gasp at the sheer brilliance of the readership

The idea is to let everyone get a chance at having a go at *Colossus*.

The Tandy in tandem with Amstrad

John Lettice compares the new Tandy 1000EX to the Amstrad PC and leaves you to draw your own conclusions

Dinosaurs may not have stalked the earth when Tandy first made it as a computer supplier – it just seems like they did. More recently, as newcomer IBM swept the board, it's seemed more a case of Tandy stocking dinosaurs, particularly in the UK. The Colour Computer and the TRS 80 series computers made some impression in the US but they were not big sellers here.

More recently the company has made efforts to bring itself back into mainstream computing, first with the Tandy 2000, similar to but not compatible with the IBM PC, then with the Tandy 1000, which was a cheap and relatively successful PC compatible, and now with the 1000EX.

The 1000EX is slightly pricier than the Amstrad PC, but is the cheapest PC clone Tandy has yet produced, and has the advantage of being available now rather than in 1987. Amstrad's new price for a 512K single drive monochrome monitor PC is £528, while the entry level Tandy is also £528 for single drive, mono 256K machine. The Amstrad has bundled Gem, while the Tandy has bundled *Personal Deskmate* software plus a year's free software support. In terms of specification it's therefore difficult to put a knife between the two.

As far as design goes, however, there is a lot of difference. With the 1000EX Tandy has abandoned the three box PC configuration and has reverted to a single unit combining system and keyboard plus detached monitor.

The basic footprint is smaller than most PCs, but most of the space gained on the desktop is used up by the monitor. This will just about balance on top of the main unit, and the colour monitor tested here dwarfed it. Tandy sells a monitor stand for the machine, and in the interests of ergonomics buying one is advisable.

There are a few interesting side effects of the compactness of the system unit. There's only room for one $5\frac{1}{4}$ inch disc drive on board, and rather than being at the front, as with standard PCs, it's tucked round the right hand side. This makes it rather more difficult to access, and makes the disc drive light pointless, as you can't see it.

The expansion slots are another space saver, and are accessed through a small pop out hatch at the rear of the machine. They aren't IBM standard, taking instead smaller Tandy cards for extra Ram, RS232 and internal modem. It's improbable that you'll get much more in the way of expansion, but it's equally unlikely that you'll need much more.

The rear of the machine, left to right, is taken up by printer port, expansion socket for a second disc drive (which can be either $5\frac{1}{4}$ inch or $3\frac{1}{2}$ inch), video socket, monitor output (standard for both mono and colour machines), the aforementioned expansion slots and a fan. Tandy clearly doesn't agree with Amstrad on the subject of cooling.

Annoyingly the printer port is the edge-connector sort Tandy used on the earlier model 1000, and equally annoyingly it doesn't have a built-in RS232 port. The cost of putting these two in is negligible for large production runs, and considering Tandy's interest in communications the absence of the latter is odd, to say the least.

The machine's power switch is on the left of the casing, while on the right you have a volume control, sound output, and joystick ports. The latter are IBM standard, just to confuse matters for all those software houses busily writing for the new Amstrad standard.

Keyboard

The clicky bit is the most perplexing part of the machine. Because it had its own standard prior to IBM Tandy has tended to do quirky things with its machines, even when it's producing an IBM compatible. The quirky thing here is that the layout, although basically qwerty, diverges from the standard in several, not always logical, ways.

Along the top of the machine you've got 12 function keys rather than ten, while the right hand side of the keyboard is – if you see what I mean – all over the place. The numeric keypad has been separated from the cursor keys, which are now tucked between the keypad and return key. *Home* and *Print Screen* are now separate keys, *Num Lock* has been moved down and a bizarre *Hold* key, for pausing a program, has been added.

Delete has moved to the top of the keypad and *Alt* is just above return, making *Ctrl/Alt/Del* (warm boot) difficult to find, never mind execute. I can see logic in making minor adjustments to IBM's layout, but this sort of rejig is just plain silly.

Software

The bundled *Personal Deskmate* software is one of the nicest things about the machine for a user on a budget. It's organised as yet another user friendly interface to applications, starting off as the Tandy Desktop, which presents you with several software options. These include an easy to use word processor, small spreadsheet, database, graphics package, calendar and communications program.

Besides these you've got various accessories, including notepad, smaller calendar, calculator and phone list that can be used from inside other *Deskmate* applications. The software clearly isn't big-league 'power user' stuff, but it should be attractive to users on a budget who want something cheap but effective. My use of the programs was, however, hampered by the fact that I didn't have a mouse. Some user friendly interfaces are fairly simple to use from the keyboard, duplicating mouse functions with the cursor keys and, say, *Home*, but this isn't one of them.

Third party software is a bit weirder. Most business applications software works fine within the limitations of the single disc drive, and as there's a facility to switch round drives when you have a second drive fitted (ie, either drive can be drive A) you could add a little flexibility by using a $3\frac{1}{2}$ inch second drive instead of a $5\frac{1}{4}$ inch.

Games software tends to test compatibility more, as games authors are less fussy about sticking to the manufacturer's hardware guidelines, and here the Tandy doesn't come off at all well. *Hacker*, which Tandy had intended to sell for the machine, doesn't respond to the cursor keys, while *Boulder Dash* has cursor left as a default (take your hands off the keys and the figure moves left rather than standing still). Tandy incidentally insists that the machine will work with the PC Junior version of *Hacker*. My version of *Hacker* says it will work with the PC Junior. You tell me.

I tried about half a dozen, and the only ones that worked properly were *World Championship Golf* and *Seven Cities of Gold*. The latter was, however, an education, as it became apparent that Electronic Arts had patched the program so that it checked to see if the machine was a Tandy, and if so produced very nice three channel sound. Now if Tandy could get everybody to do this it could use the machine's sound (much better than the PC's feeble beeping noise) as a selling point.

The problem with the games seems to be related to the scanning of the non-standard keyboard, but even some of the ones that didn't work all that well pointed up the Tandy's graphics, which

are very good indeed The price paid here appears to be in terms of speed My patent *F 15 Strike Eagle* test (see *Popular* September 25 1986) took almost twice as long to execute as on the Amstrad PC and other games also seemed fairly slow This, of course won t affect serious software so much unless you're doing a lot of graphics work

Verdict

The 1000EX does have defects in terms of speed and compatibility although the latter could be worse as Tandy is taking steps to sort it out and in any event always carries a good range of software support for its machines On the plus side its bundled software makes it a better plug in and go deal than the Amstrad and the addition of sound and improved graphics might make it a better deal for some people

Is it better than the Amstrad? Probably not although I find myself veering back and forth between yes and no In terms of industry standard expandability the Amstrad is certainly better, but if you want something halfway between a PCW and a PC you might find the Tandy more to your taste

Product *Tandy 1000EX* **Price** £628 for 256K single drive and mono monitor **Supplier** Tandy UK Leamore Lane, Bloxwich, Walsall West Midlands WS2 7PS (0922 477778)

A clear vision

The Amstrad idea of connecting your computer to a monitor instead of hogging the TV seems to have come full circle with this piece of hardware from Screens Micro Distribution The Screenvision is a TV tuner which allows your monitor to receive television pictures (and use a video recorder with it) for the bargain price of £70 If no one in your household has a TV licence though you ll have to budget for one of those as well unless you want to run the gauntlet of the Home Office detector vans

Unpacking the Screenvision from its box reveals a grey and black plastic case adorned with eight channel selectors on the front and various knobs and sockets on the back These include brightness, sound colour and contrast controls linear RGB (not TTL) phono composite video BNC and TV sockets so you can use any comparable monitor The casing is strong enough for everyday misuse but I wouldn t recommend you plonking anything heavy on top as a detrimental effect will probably be the outcome

Setting the tuner up is a fairly simple matter First the monitor lead has to be plugged into the back Then the channel selectors have to be tuned in via the drop down panel on the front Finally connect up an aerial and away you go

Or maybe not It all depends on the quality of signal you receive in your area If you live in a very poor reception area then a portable aerial will be no good and you must connect the tuner up to an external one if you want to avoid wasting your money

To test the Screenvision we compared the pictures from it with those on a portable TV using the same aerial for both Allowing for the fact that the test site is well shielded from TV signals the Screenvision s picture matched that of the portable (which produces a good display elsewhere) in clarity but had much more difficulty picking up colour The instructions supplied do in fact point out that in low signal areas colour fade will be evident

However bearing possible reception problems in mind and assuming you have the licence business covered then the Screenvision is a cheap way of getting a TV even if you have to pack the computer away while you use it

Duncan Evans

Product *Screenvision* plus RGB or composite monitor **Price** £80 95 **Supplier** Screen Microcomputer Distribution, Main Avenue, Moor Park, Northwood Middlesex

Having fun in public

Marcus Rowland reviews public domain computer games

Two weeks ago we looked at the possibilities of using cheap public domain PC software for business use. This time I'm going to discuss some of the games available from the public domain network.

Most commercial games are somewhat expensive (for example £19 or more for a fairly run of the mill arcade game, compared to £8–£9 for a better Spectrum equivalent, or £1.99 if you're talking budget), but there's one interesting alternative: the cheap and free programs distributed by special interest group (SIG) libraries. All of the software in these libraries is either public domain or Freeware.

For a full explanation of the salient differences between public domain software and Freeware, see the corresponding article in *Popular*, November 6. If you don't have the article to hand then basically public domain is available free of charge and the user has permission to copy it or modify it at will. Authors of Freeware programs generally expect some payment; if users register with the author they usually get free upgrades of the program.

Many of these programs are available from the American PC SIG and PC-Blue collection and Britain's PCBBUK (PC Bulletin Board UK) Library (see below for addresses). Prices for duplication of one library volume to a 360K formatted disc varies between around £1.50 and £2, and a membership fee is payable.

The best way of finding interesting games is probably to club together with other people using the same machine, since large orders generally cost less. Remember that, to quote Sturgeon's Law, 90% of everything is crud. This is unfortunately true of the vast majority of games available through these channels. The discs are crammed with endless versions of *Mastermind*, Guess the Number and Tic-tac toe (Noughts and Crosses), many of which don't use colour. However, given several hundred programs, there has to be a few gems in there. The programs below are a small selection, ones I've liked enough to keep. Most of the volumes mentioned include several other games of varying quality.

Programs were tested on a 640K IBM PC with a colour card and RGB monitor and were tested in the same way as the business programs two weeks ago. Most have also been tested (fairly briefly) on the new Amstrad PC.

PC Chess, by Mike Carpino, is a workmanlike implementation of the game. It offers four levels of play, use as a board for a two player game, clocks, colour or monochrome display, optional self-play, board rearrangement, exchange of colours, joystick or keyboard control, hard copy, game save (for a maximum of 26 games) and sound (a beep as each piece is moved). Moves are entered by joystick or by algebraic codes. I'm a poor player and have never beaten this program or found any obvious weaknesses. A friend who is more expert says that it plays well, but will occasionally interpret perpetual check as a draw. The disc includes 18 pages of instructions, configuration routines, and three program modules which must be prepared for use by a fairly simple set-up procedure.

The workman's chess game

PC Chess needs only 64K and includes colour or monochrome versions. Registration is $15 (around £10), without benefits (PC SIG Vol 120).

Duelling Starships, by d'Angelo and Dea, is a two-player tactical combat version of *Star Trek*. The screen and keyboard are split in half, and the documentation includes templates for cardboard masks, used to stop each player seeing the other's half. Unfortunately the left hand player is supposed to use the function keys; many PC-compatibles (for example, the Tandy models) have these along the top of the board.

The game works in real time, and a player with fast responses might easily get in two or three shots before the other retaliates. It uses text characters only, and there is no way of configuring it to give colour on a colour display. The disc holds 26 pages of documentation. *Duelling Starships* needs only 64K. Registration costs $15, no benefits are specified (PC SIG Vol 260). A CP/M version is also available.

3 Demon, by John D Price and Rick Richardson, takes two old ideas, three dimensional mazes and *Pacman*, and combines them into an entertaining game. The player has a restricted view of the maze, plus a radar display showing the distance and bearing of ghosts (called ghouls). The cursor keys control movement (rotation and forward motion), the cursor pad *plus* key brings in a map of the maze and suspends the game. There are nine levels, all fast, with the top 10 scores for each level saved to disc. It uses simple but effective medium-resolution colour or monochrome graphics, and the ghosts look convincingly menacing (in a jelly-like way) as they prowl the maze. It's the only game to have a help screen which can be used in play. Documentation is on the disc, but seems to be designed to be viewed on the screen only; page breaks don't correspond to any normal paper size.

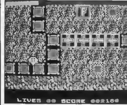
3 Demon requires 128K and a colour graphics board with a colour or monochrome monitor. Registration is $10 (around £7); the source code is sent for $50 (£35) (PCBBUK Vol 40).

Janitor Joe by Kevin Bales is a fairly simple platform game, owing a lot to *Jumpman* and other games of its ilk. Control is by cursor keys and spacebar or joystick; options include levels and sound. A colour display is needed, and the characters are fairly small and lacking in detail. The disc includes a help file with suggestions on strategy (and cheating) for each level of play.

Janitor Joe needs 128K and colour and is in the public domain (PC-SIG Vol 176).

Willy the Worm by Alan Farmer is a similar platform game. However, it offers eight screens and the disc includes a screen editor which allows game customisation. It can be configured for graphics or for the basic IBM text mode (essential for some clones and minimum configuration IBM PCs), plays some pretty tunes and is reasonably fast. The top ten scores are saved to disc; there's also a display of the ten best scores of the day.

More games next week



Code Master's brilliant début

Code Masters have finally released their first batch of games, and there can be no doubt that if they keep this initial high standard up Mastertronic and Firebird are at last going to have some significant competition on their hands

Terracognita has been written by Steve Curtis (author of that Mastertronic biggie *Mon aqueterrous*) and it's solid budget fare

Nothing too demanding in the brain department apart from reasonable map making skills but your reflexes will know about it all right

You are faced with a screen scrolling vertically downwards – scattered with impassable walls with tiny gaps and the obligatory kamakazi aliens Through this futuristic impression of Oxford Street on Christmas Eve you must manoeuvre your spacecraft left right, up and down, zapping like mad and trying to pass over certain special squares (giving bonus score, extra lives extra fuel etc) and avoid others (time warp it takes you back to the start and speed up squares that make the screen scroll faster)

Code Masters say that there are about 100 screens worth of scrolling in the thing – so you can be assured that cracking it will take quite some time even using the cheat I've discovered

Totally unlike his last offering Steve has produced another little cracker – one that is certain to find its way into one or two Christmas stockings

Popular Appeal ◆ ◆ ◆

John Cook

Program *Terracognita* **Micro** Spectrum/Amstrad CPC **Price** £1 99 **Supplier** Code Masters, 1 Beaumont Business Centre, Beaumont Close Banbury, Oxon OX16 7RT.

A brave new world for the Commodore

Anco's decision to support the Commodore C16 and Plus/4 is a brave one, and all owners of these neglected machines should wish the company luck. It's fairly easy to produce fast fleshy arcade games with not too much sophistication on the C16, something which uses the full 64K memory of the Plus/4 should though be as good as if not better than a Commodore 64 program, and Bridgehead doesn't quite come up to that standard

It's a joystick-only combination of platforms and-ladders and Commando, the screen scrolls horizontally and you control a small animated soldier armed with a knife and grenades. There are 64 screens to get through, all of which scroll bidirectionally, although the backgrounds are pretty chunky, big bright patterns rather than fine detail

Enemy soldiers become progressively more vicious, attacking with guns, bazookas and heat seeking missiles Stabbing them requires split-second timing, and removing landmines with grenades demands precise aim Apart from that it's just a matter of climbing ladders and negotiating causeways, picking up spare ammo and penetrating through to the enemy base

Not an inspiring game, but worth considering if the lack of Plus/4 arcade software is getting you down

Popular Appeal ◆ ◆

Chris Jenkins

Program *Bridgehead* **Micro** Commodore Plus/4 **Price** £5 95 **Supplier** Anco, 4 Westgate House, Spital Street Dertford, Kent.

Mailstrom delivers

One of the few games coming out this Christmas not to be based on a Sylvester Stallone film. *Mailstrom* is a highly individual fantasy

Civilisation has collapsed, criminals roam the streets public servants fear for their lives, anarchy rules. It's like a Saturday night on the Broadwater Farm Estate

Through this chaos strides the heroic figure of Micheel Nasty, postman, with his high powered heavily-armed bright red van, and a determination that the mail must get through

The van moves left to right across the scrolling background, and Micheel's actions are controlled using icons at the bottom centre of the screen He can be made to leave the van to collect items found in the road store them in the back of the van check the status of the van and select weapons and power boosters

Your task is to collect sacks of mail from the sorting office and deliver letters to the houses indicated Along the way you must open post boxes, deposit empty sacks at post offices and avoid attack from various antisocial elements

This is a pretty minor game, featuring reasonable levels of programming and invention, but nothing spectacular I do hope though, that our postmen get to see it, and become inspired by Micheel Nasty's example to deliver the post to us before 1 00 pm sometimes

Popular Appeal ◆ ◆ ◆

Patrick Archer

Program *Mailstrom* **Micro** Spectrum **Price** £7 95 **Supplier** Ocean 6 Central Street Manchester M2 5NS

Avenger runs the gauntlet

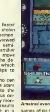
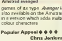
Don t be fooled by the sub-title *Way of the Tiger* into thinking that *Avenger* is just a re-run of the original martial arts adventure In fact, if anything, it s closest to all the *Gauntlet* clones – *Dandy Druid* and so forth

Avenger casts you as a bold ninja warrior out to avenge the murder of your foster father and retrieve the stolen scrolls from the evil Yaemon The playing area is viewed from above with the semi-perspective effect familiar from *Gauntlet*. Your move your warrior around the detailed background, which scrolls so far then flips to another screen


On the Spectrum

Your opponents who can be defeated with ninja stars or well placed kicks to the groin consist of various oriental baddies and nasty monsters Defeating them results in their disappearance in a puff of dust *Ultimate*-style

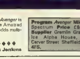
There are keys to collect doors to open traps to avoid, good tunes to listen to and lots of fast and colourful action Certainly one of the best games of its type *Avenger* is also available on the Amstrad in a version which adds multi-colour characters

Amstrad avenged

Popular Appeal ◆ ◆ ◆ ◆

Chris Jenkins

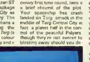


Program *Avenger* **Micro** Spectrum **Price** £9 95 **Supplier** Gremlin Graphics Alpha House, 10 Carver Street Sheffield S1 4FS,

Everyone's a mercenary . . .

After first appearing on the Commodore 64, *Mercenary* has now been released for the Atari ST in a compendium package featuring the *Second City* as well as *Escape from Targ* The compendium itself contains a plastic wallet housing the game disc, *Interlude on Targ* (a short story) a glossy colour map of Targ Central City and a couple of plain maps covering the underground complexes

For those who missed *Mercenary* first time round, here a a brief réumé of the plot Your spaceship has crash landed on Targ smack in the middle of Targ Central City in fact a planet half in the control of the peaceful Palyars though they're not averse to blasting away should you decide to flatten some of their buildings (which collapse in a wonderfully animated way), and half under the thumb of the invading Mechanoids Your objective is simple Escape from Targ To do this you'll need transport, lots of money and a ship capable of reaching the Palyar colony craft hovering far above the city


Three dimensional escape

In order to get the money certain tasks for either side, or maybe both must be performed, and various puzzles within the complexes beneath the city have to be solved First thing to do though, is get some wheels (or wings in this case) Handily there's a ship nearby which the Palyars are willing to sell for 5000 of your 9000 credits If you re of a light fingered persuasion then the alternative is cheaper but more dangerous

All the action takes place in wire frame 3D graphics which move smoothly when flying slowly and whizz past at an incredible speed when full throttle is applied The graphics are exactly the same as on the C64 version being three colour and not devastatingly impressive, although the animation and speed are

After getting airborne the next objective is to find an elevator to take you underground where you must roam around collecting objects and figuring out how in hell you re going to get off Targ

Even if you do escape there's always *The Second City* on the disc to play The *Mercenary Compendium* offers arcade, strategy and problem elements and, given pricing in the ST software market a good value for money game

Popular Appeal ◆ ◆ ◆ ◆

Duncan Evans

Program *Mercenary Compendium* **Micro** Atari ST **Price** £24 95 **Supplier** Novogen Software Ltd, 142 Alcester Road, Birmingham B13 8HS.



Evesham Micros
PRINTER OFFERS
Check out these offers on top quality printers. All the models offered are substantially reduced from the normal high street prices. Prices are fully inclusive of VAT, delivery and lead to suit any computer with centronics parallel printer port eg Amstrad, BBC, Atari ST, Dragon, IBM PC or compatible, Memotech or MSX. For the CBM 64/128 we supply a user port centronics cable. For Spectrum or QL owners an appropriate interface is supplied for an extra £20.00, for 8-bit Atari models an interface is supplied for an extra £30.00. If you require a detailed print sample of any model please send a S.A.E. stating your requirements. Delivery is by secured receipted delivery. All orders are despatched the next working day after receipt provided we have stock.
PANASONIC KXP 1080
Now an even better price for this popular printer. A huge number of print options can be achieved, the switch selectable NLQ being available in all modes except sub/superscript. The quality of the NLQ is far better than other similarly priced printers. Features include 100 cps draft mode, 20 cps NLQ, friction and tractor feed, Epson compatibility and easy change long life ribbon.
ONLY £179.95
MICRO P. MP165
The best NLQ of any printer in the price range? Most people who see it think so. The printer has proved very, very popular over the last year and even more so at this superb competitive price. An unusually high draft speed of 165 cps and its superb switch selectable NLQ at 35 cps make this the class winner for performance per pound. Standard features include friction and tractor feed, 2K buffer, Epson compatibility, quiet operation and full graphics capability. Must be the highest spec available for the price.
ONLY £219.95
STAR NL10
New high specification printer just released. All the usual features PLUS easy front panel selection of most modes, semi automatic single sheet feed, double and quad height characters AND plug in interface cartridges. Choose between standard centronics parallel, IBM or Commodore. Ideal for Commodore owners who want the convenience of a CMB ready printer but may wish to change later, just buy a new interface cartridge for £39.00. When reviewing this model in a group test with the Epson LX80, Citizen MSP 10E and others, What Micro magazine referred to it as "the Rolls Royce of these printers". A single sheet feeder is available for £63.00.
OUR PRICE: ONLY £259.00
(state which cartridge required)
JUKI 6100
A superb DAISYWHEEL printer, this model provides the highest quality print that only a daisywheel can provide. Print speed is 20 cps and the daisywheel itself is of the common Triumph Adler type. Ribbons are of the cheap and easily obtainable IBM selectric variety.
ONLY £299.00
MICRO P. MP200
A brand new very high specification dot matrix printer which will print in draft mode at 200 cps and NLQ at 40 cps. Additional font cartridges are available to vary the print style. Most functions can be accessed from the front panel as well as through codes. Another high spec feature is its 8K buffer. It is Epson compatible and has full graphics ability.
ONLY £399.00
HARDWARE SPECIALS
ATARI ST
1040 STF Mono £799.00
1040 STF Colour £999.00
520 STM c/w SF354 disc drive £443.00
(These prices include VAT and "The Pawn" F.O.C.)
LIMITED OFFER
Complete brand new CBM 64 circuit boards. Repair your own 64, upgrade your VIC 20 or keep as a spare. £45.00
CBM 1541C Disk drive £189.95
CBM MCS801 Colour printer £199.95
CBM 64 power pack £24.95
CBM compatible data rec £29.95
CBM 64C connoisseur's pack c/w mouse, tape deck, s/ware etc £235.95
ALL OFFERS SUBJECT TO AVAILABILITY

IBM COMPATIBLE MACHINES
Bondwell PC BW34 640K RAM dual dr 360K 5¼" drives 12" green monitor. Bundled MS DOS GW basic
RRP £888.85 WAVE £803.00 (a)
Bondwell PC BW38 Specifications as BW34 except single drive + 20Mb Winchester hard disk
RRP £1148.85 WAVE £1025.00 (a)
HARDWARE
	RRP	WAVE
Amstrad PCW 8256 inc printer monitor and software	£458.85	£403.00 (a)
Amstrad PCW 8512 inc printer monitor and software	£573.85	£513.00 (a)
2nd 3" Drive ONLY PCW	£182.85	£130.00 (b)
2nd 3" Drive + 256K Ram upgrade PCW	£232.85	£182.00 (b)
CPS 8256 Cent + RS232 Interface → PCW	£88.94	£60.00 (c)
Alphacom 32/Timex 20/40 printer spec/ZX81	£49.95	£18.95 (c)
BBC Master 128	£499.00	£430.00 (a)
Ferguson 37140A 14" Portable TV	£199.99	£182.00 (a)
Ferguson 14C1D 14" Portable TV New Monitor Style black	£189.99	£180.00 (a)
Psion Organiser I hand held computer w.r.l	£99.95	£70.00 (c)
CBM MPS803 Dot Matrix Printer inc Tractor Feed	£199.90	£150.00 (a)
CBM 64C Connoisseurs collection inc CBM64C C2N cass unit NEOS Mouse & Software + Cheet Monopoly Cluedo Scrabble Renaissance Typing Tutor	£249.99	£217.00 (a)
DMP 2000 Printer inc free cable for CPC	£169.00	£151.00 (b)
Amstrad CPC 6128 Colour	£399.00	£391.00 (a)
ZX Spectrum plus 48K inc free s/w	—	£95.00 (a)

SOFTWARE
		RRP	WAVE
Sage accounts 1	8128/PCW	£99.99	£71.50 (d)
Sage stock plus invoicing 2	8128/PCW	£69.99	£50.00 (d)
Sage payroll 3	8128/PCW	[illegible]	£50.00 (d)
Sage accounts plus 1+2	8128/PCW	£149.99	£107.50 (d)
Sage combo pack 1+3	8128/PCW	£149.99	£107.50 (d)
Sage super combo pack 1+2+3	8128/PCW	£199.99	£143.00 (d)
Sage retrieve (database)	8128/PCW	£69.99	£50.00 (d)
Sage magic filer (high speed filing and recall)	PCW	£69.99	£50.00 (d)
Locomotive DMAIL (mail merge for Locoscript)	PCW	£29.95	£23.00 (d)
Locomotive Rotate (prints new files sideways)	PCW	£24.95	£15.00 (d)
Arnor Prospell (all u/p's inc Locoscript)	PCW	£29.95	£19.80 (d)

All prices include VAT. Please add carriage indicated as follows: (a) £5.00 (b) £4.00 (c) £2.00 (d) £2.50 (e) £1.00 (f) 50p. Despatched by return of post.
W.A.V.E. (mail order)
Walney Audio Video & Electrical
53 Shearwater Crescent, Barrow-in-Furness, Cumbria LA14 3JP. Telephone: 0229 44753

"THE ADVENTURERS HANDBOOK"
The monthly book no self-confessed adventurer should be without
"Stunning value" – Tony Bridge, PCW
issue 13 available now!
44 pages of adventure help and news for just £1
FOR EVEN BETTER VALUE
TAKE ADVANTAGE OF OUR SUBSCRIPTION RATES
3 issues for £2.75
6 issues for £5.00
12 issues for £9.00
Issues 1 to 12 are still available and cover hints, maps and solutions to over 225 adventures (issues 1–12 for £9 or £1 each individually)
ARCADE PLAYERS



The Space Idiot and the Flook

Tony Bridge is delighted by some non-mainstream adventures

David Oye from Banbury is obviously a Wally Fawkes fan, as his new *Quill*'d adventure for the Amstrad is called *Flook* (actually *Flook One* as others in the series will be coming along soon) Although the original Flook was a little furry snub-nosed creature in David's story Flook is your surname The player takes the role of Heronimus Flook mild-mannered computer programmer who has been caught by the boss playing (shock horror) adventure games and incarcerated in a remote farmhouse – a very strange reprimand I must say Anyway here you are stuck in the very first location and trying to get out All the usual *W E S N Up* and *Down* commands have no effect neither can you *Break Door* or otherwise escape that way

Then you notice the computer in the corner, currently displaying a zap-'em-up game This holds the key to your liberation which isn't far away even though you uncover a bug in the meantime Once escaped from the farmhouse you'll be able to visit many locations and discover some useful objects

The puzzles associated with them are to a large extent rather nonsensical, although there is a certain crazy logic I suppose (you can do some very interesting things to an 'elephant sized geranium' with a clockwork mouse), and it's a case of manipulation and waiting for something to happen

But there is a good atmosphere evoked by the text, which is rather chatty and humorous even though the style isn't up to much and a few spelling mistakes crop up Speed of responses are up to the usual *Quill* standard and you'll find an answer to most inputs (the default, rather than being the more usual I don't know what you mean is a faintly amusing bit of Franglaise but at least that's better than the desperate Come on you idiot kind of answer found in all too many *Quill*'d efforts nowadays)

All in all nothing too world-shaking but a good beginner's adventure (as well as a good hint sheet if required and a newsletter) for a very good price, just £1 75 for a cassette or £1 25 plus a formatted disc from David at 24 Kingsway Banbury Oxon OX16 9NY The second part is due now and a third is well on the way

There are some weird people about – many of them seem to be writing and playing adventures and West Yorkshire holds its fair share of them if Microtech's effort *2001½ – a Space Idiot* is anything to go by

The adventure is *Quilled Patched* and *Illustrated* and a lot of thought has gone into the composition of the story, as you'll see from the very start – the loading screen is sensational (and thankfully, quick to load) The original 2001 (upon which this story is most definitely *not* based) employed two Strausses Richard and Johann for incidental music and so it's very fitting that Microtech use part of Mozart's *Eine Kleine Nachtmusik* until the player presses a key to begin the poor old Spectrum copes as well as can be expected

The opening text screen is a bit hackneyed though These are the voyages of the Starship Retrograde its five-year mission to boldly go where we've been umpteen times before Far into the future lay intrigue, mystery horror, tension, excitement, curious beings, intelligent computers thrills spills wonder war muck raking and automated toilets *But* in this adventure these are irrelevant and so on However, this is the only hint you might get of a story – broadly the adventure is space-y with a futuristic character set, and the main quest is Escape from the ship before it collides with Belta Goose (although there is a secondary quest which is up to you to find)

The opening sentence in the documentation says Explain this if you can I don't think I can so let me give you verbatim a couple of location descriptions which should give you some of the flavour of the proceedings

You are not not in the entertainment 1/4s There isn't a constant drip dripping of yellow steam in the caverns of the captain's mouth Unwantedly the hassle of your Christmas shopping is non-existedness And Store room are you in? No I'm am Have you ever seen the monster? No I'm am Where do you live? In a living place And every other description is equally baffling Some are genuinely funny (a dim understanding of what is going on permeates the thick Bridge skull) while others are merely annoying The funny bits come not only from the crazy imagery but also from the thinly-disguised characters that pop up occasionally like Neil Armweak and Fungus McNeil who seems to have done something very nasty to Microtech

There are lots of locations to be explored and progress forward is mostly easily accomplished The first problem you come across, however, is in moving around All direction commands and many of the others are transposed so that North, for example becomes Northwest and so on, and you must *Wear* objects to get them and *Take* them to wear them Why, I haven't the faintest idea, and as far as I can see you're not made aware of this fact – rather you must sort things out for yourself

Although most adventures are written (and played) with puzzle-solving in mind nevertheless there is room for games which create an atmosphere in which the player can wander around manipulating the environment Infocom I suppose is the expert at this (see *Suspended* and *Mind Forever Voyaging*) but the occasional budget game turns up which is worth playing for reasons other than the sheer cracking of logical conundra

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand

Fill in the coupon, explaining your problem, send it to us, and a fellow adventurer may be able to help

Remember – the system only works if those adventurers who have solved the puzzles get in touch Every week is Save An Adventurer Today (SAAT) week!

Adventure .... on (Micro) ....
Problem ....
Name ....
Address ....



Avoid the trap

Tony Kendle passes along solutions for Trapdoor and Strike Force Cobra

Those lucky enough to be near a television set at four in the afternoon or who have a video recorder at their disposal should make an effort to catch up with the marvellously creepy ITV programme *Trapdoor*. For those that can't see the program look out for the Piranha software release of Don Priestley's excellent *Trapdoor* game which perfectly captures the atmosphere with some superb cartoon-like graphics. It also earns the distinction of being the first TV spin-off which appeared before the original.

Many many thanks to the team at MikroGen who have heard and acted on my plea for help with the fiendish *Frost Byte*. I know that a few people have had trouble even getting off the first screen. Unfortunately it's not particularly easy when you do know how, but here goes anyway.

Start. You start in room seven (don't ask me why but it must have made sense to somebody). To finish the first level you must leave through the exit in room one.

Room Seven. Take the bullets which are to the right of the gate and 'use' them so that you are able to fire. You can't shoot the top alien but fall off the platform to the left and shoot the bottom two aliens. Walk along the bottom into room eight.

Room Eight. To get past the water drops you have to keep jumping in the air and at the right time move right as you are falling. Before going past the second water drop shoot the alien beyond it. Proceed to room nine.

Room Nine. Shoot the rotating tripod on the ground and run along to the mattress. Jump on to the mattress and shoot the other alien. Jump up into room six and climb on to the platform.

Room Six. Take the red crystal but don't use it. Shoot the alien on the other side of the water drop. Then get past this water drop by again jumping up and moving left as you fall.

Room Five. Use the red crystal and run underneath the three aliens. Then pick up the green crystal and use it, shooting the alien above you and jump on to the ledge. Proceed into room four.

Room Four. Move down so as to land just behind the green alien and shoot it quickly from behind. Get past the water drop by jumping up and moving left as you fall (I seem to have heard this before but it isn't as easy as it sounds). Clamber up on to the mattress and jump up into room one. Shoot the first alien and then shoot the alien beyond the water drop. Get past the water drop as usual and take the red crystal and go into room two.

Room Two. Use the red crystal and then run underneath the first alien and jump up onto the platform. Run underneath the fast moving blue alien and take the green crystal. Use this crystal and get very close to the right hand edge of the room and then jump.

Move right into room three as you fall.

Room Three. You should have landed on the platform. Kill the first alien and then fall on to the mattress. Jump up into room one and clamber on to the platform with the other kreezer. Go over and rescue him. Fall back down into room one and leave via the exit. You have completed level one.

If anyone gets further than this and can send in some more tips I will be very pleased to hear from you.

Iain Tatch, our Chingford correspondent, has written again with a 'simple little routine giving infinite lives on Micropower's *Frenzy*. Although not a very well known game it does feature on *Computer Hits Two* and so the poke should hopefully be of use to a fair number of people.

Once the game has loaded all you need to do is press *Break* and then type *?&176B=&A9 ?&176C=1 Call &275A*. This will give you infinite lives on what I think is an otherwise very frustrating game.

Jim Bisset of Leven in Fife has sent in a similar poke for an undistinguished but widely owned game. Given out free with every Sinclair QL is *The Games Cartridge*. One of the games on this is a version of the ubiquitous *Breakout* in which there are four lives. The following poke extends this to 255 lives.

```
Load mdv1_breakout (Enter)
135 poke v+(256042-256000) 255 (Enter)
Run (Enter)
```

Given the number of these games in existence I would envisage this being well used!

Thanks to both of you for the tips.

Charts

Top Twenty

1	(6)	Computer Hits Vol 3	Beau Jolly
2	(3)	Trivial Pursuit	Domark
3	(1)	Infiltrator	Mindscape/US Gold
4	(17)	Uridium	Hewson
5	(14)	180	Mastertronic
6	(11)	Thrust	Firebird
7	(19)	Kane	Mastertronic
8	(4)	Fist II	Melbourne House
9	(–)	They Sold a Million (3)	Hit Squad
10	(–)	Ollie and Lisa	Firebird
11	(5)	Paperboy	Elite
12	(6)	Ninja Master	Firebird
13	(2)	1942	Elite
14	(–)	Happiest Days	Firebird
15	(7)	Ghosts and Goblins	Elite
16	(–)	Ace of Aces	US Gold
17	(–)	Fairlight 2	The Edge
18	(16)	Warhawk	Firebird
19	(–)	Head Coach	Addictive Games
20	(–)	American Football	Mind Games

All figures compiled by Gallup/Microscope

The 2,000 envelopes, please...

Congratulations to 65 readers and commiserations to the other 2 000 who entered our recent movie quiz

Few of you will need reminding of the great prizes but just in case we were offering five Spectrum Plus 2s from Amstrad ten Star STX-80 printers and 50 Mastertronic Magnum joysticks

We gave you eight stills from some of the greatest science fiction movies of recent years and asked you to identify them We expected some of you to have trouble spotting Star Trek II -- The Wrath of Khan from the other Star Trek movies and indeed we caught some of you out



Star Trek II not III The hint is the ship s name the USS Reliant

More surprisingly many of you confused Escape From New York with Bladerunner

Here are the correct answers
1 Alien
2 The Last Starfighter
3 2010
4 Return of the Jedi
5 Dark Crystal
6 Star Trek II
7 Escape from New York
8 Logan s Run

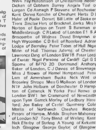


And here are the winners
Spectrum Plus 2s are on their way to Philip Dixon of Sunderland Philip Wainwright of Northampton Andrew Noble of Hull D T Davies of Weston Super Mare and Clive Parker of Bristol
Star Micronix printers will be heading towards George Leith of Ellon Aberdeenshire Steve Fitton of Heywood Lancs Andrew Pennington of Huyton Merseyside Simon R of



Escape From New York not *Bladerunner*

London SW3 Marcus Johnson of Graffham W Sussex Sean Haydon of Bilston W Midlands David Turvey of Thames Ditton Surrey D Liptrot of Durham I Henderson of St Ives Cambs and P Rogers of Skelmersdale Lancs



The winners of the 50 joysticks are Ian Lawson of Ulverston Cumbria Graham Panton of Denton Manchester Keith Muscat of Newcastle upon Tyne Anthony Dayus of Witton Birmingham Philip Gode of Malvern Worcs Lawrence Fryer of London NW4 Fay Hutchinson of Chesterfield Robert Dicken of Cobham Surrey Angela Toal of Lurgan Co Armagh P Stevens of Rochester Kent Dervis Koncha of Cheshunt Herts D L Hyler of Poole Dorset Bill Little of Stoke on Trent Sinclair Hart of Bracknell Berks Mrs H Norton of Burton on Trent S Bateman of Middlesbrough C R Lated of London E1 B A Briscombe of Widnes David Benjamin of High Wycombe C D Sell of Romford Adrian Lodge of Barnsley Peter Tobin of Hull Nigel Main of Hull Thomas Adams of Chester Lawrence Ding of London SW16 Peter Lord of Exeter Nigel Parsons of Cardiff Cpl G S Sporne of BFPO 20 Dortmund Anthony Baker of London, C J Davies of Stevenage Miss J Brown of Hemel Hempstead Peter Lem of Amersham Bucks Nick Wild of Broseley Shrops Miss G Mollison of London N18 John Holburn of Dorchester D Hampton of Catterick N Yorks Paul Reeve of London SW1 Ian Crammond of Newcastle upon Tyne Garrick Morley of Ledbury Hereford Joe Bailey of Castel Guernsey Colin Morris of Northwich Cheshire Ricardo Perroni of Harrow Middx Stephen Mahoney of London N7 Tony Bland of Welling Kent Nick Ellerby of Stirling A Young of Kirkintilloch Glasgow George Gaylor of Glasgow Huw Griffiths of Swansea I H Cook of Houghton le Spring Tyne & Wear Mark Boddy of Letchworth Herts

This is your second chance

English Software s *ElektraGlide*, the racing game with a surreal touch, is now available for the Amstrad CPCs on both tape or disc And here at *Popular* we ve got 20 to give away if you can get these three devastatingly simple questions right

1 Who won the 1986 Formula 1 World Driver's Championship?

2 Where is the French 24 hour road race held?

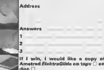
3 Which Formula One team did Nigel Mansell drive for in 1986?

Now just fill in the coupon below, send it – or a photocopy – to *ElektraGlide* Competition, *Popular Computing Weekly* 12–13 Little Newport Street London WC2H 7PP and an Amstrad *ElektraGlide* could be yours

One entry per person only please The first 20 correct entries picked at random will receive a copy of *ElektraGlide* for the Amstrad CPCs All entries must reach us by Wednesday December 10

Winners names will be published in *Popular Computing Weekly* December 18





Name

Address

Answers

1

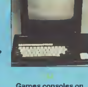
2

3

If I win, I would like a copy of Amstrad *ElektraGlide* on tape ☐ on disc ☐
Tick appropriate box.

POPULAR Computing WEEKLY
SPECIAL supplement
1986 Nov 20–Nov 26

HARDWARE SYSTEMS



If you are seriously interested in computers, choosing a system represents a frightening challenge Apart from the money you might have to invest, if the system you choose will not do the job you will probably be left with an unsellable white elephant

This supplement looks at the ten top systems available this season Each one should be right for someone, decide whether your interest lies in programming games, business, or specific applications, and our guide will help you to find the right one

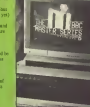
There's also a feature on the bargain micros which might tempt you discontinued lines which still have something going for them – on IBM clones, and on games consoles Choose carefully! ◀

The crucial choice

CHOOSE A COMPUTER THIS CHRISTMAS FROM THE TOP TEN IN THE SHOPS THE POPULAR TEAM PRESENTS THE CHOICES

ACORN BBC MASTER COMPACT

Components: Keyboard, 3 5in disc drive (800k) colour monitor
Software View, ABC Logo, Timpaint, Icon Software utilities
CPU: 65C12 (low power CMOS version of 6502)
RAM: 128K
ROM: 32K
Storage device: disc drive
Ports disc, printer, joystick, econet, RS232, Composite Video RGB, expansion bus
Sound three music, one special effects (AY 3 8912)
Graphics: 640 × 256 – 2 colours, 320 × 256 – 4 colours, 160 × 256 – 8 colours + 8 flashing, 320 × 256 – 2 colours, 160 × 256 – 4 colours, Teletext 80 × 75 – 8 colours All modes except Teletext, multi colour
Keyboard 10 function keys, keypad
Basic: The best on any 8 bit computer
Other languages None available on 3 5in disc
Expandability: Limited to expansion bus add-ons (of which there aren t any as yet)
Software compatibility. Not directly With special cable adaptor, DFS Rom and 5 25 inch disc drive 75% of disc software
Software availability very little
Distributors. High street, specialist dealers
Applications: Word processing Should be good for games education and business when software becomes available.
For/Against: Has good Basic, 64k of memory available for Basic, high resolution graphics Poor availability of colours, 3-5in disc drive severely limits software available
Other Comments: System available without monitor at £440 or with monochrome at £537
Cost. £667



AMSTRAD CPC 6128

Components: Keyboard with built-in 3in disc drive, colour or monomonitor
Software: CP/M Plus, GSX, Logo
CPU: Z80
RAM: 128K
ROM: 48K
Storage device: 3in disc cassette
Ports: Joystick, disc, centronics printer, RS232, cassette user port, stereo sound, power/monitor sync
Sound: AY 3 8912, three channels plus noise
Graphics: 160 × 200, 16 colour; 40 column 320 × 200 4 colour; 8 column 640 × 200 2 colour
Keyboard: 74 keys, numeric keypad, cursors definable function keys
Basic: Upgraded Mallard basic with added graphics and disc commands
Other languages: Forth, Pascal, C, etc
Expandability: Up to 256 16K ROMS
Software compatibility: Runs virtually all CPC 464/664 programs plus CP/M30
Software availability: Some high street, specialists, mail order
Distributors: Some high street, specialists
Applications: Games, business, programming
For/Against: Popular machine good spec, fast disc drive, fair software library Disc software expensive, some CPC 464 software will not load, system must be bought with special monitor
Other Comments: A good all round system which provides everything the first-time buyer needs to get underway
Cost: With mono monitor, £299 99 colour, £399 99

AMSTRAD PCW 8256

Components: Keyboard, monochrome monitor with built-in 3in disc drive
Software: Locoscript, CP/M Plus, DR Logo Mallard Basic, Mail 232
CPU: Z80
RAM: 256k
ROM: Bootstrap only
Storage device: 3in disc
Ports: Dedicated printer port, custom expansion bus
Sound: Single channel internal speaker
Graphics: 640 × 200 mono
Keyboard: 4 function keys, four way cursor keys, specific word processing keys
Basic: Mallard Basic, business oriented with poor graphics handling
Other languages: Logo bundled
Expandability: Up to 512K
Software compatibility: Runs CP/M Plus programs configured for 3in discs
Software availability: Specialist dealers
Distributors: High street, plus office equipment suppliers
Applications: Word processing, business
For/Against: Ideal bundled word processing system, fast disc drives, 90 column display No colour, primitive sound difficult to interface other printers
Other Comments: PCW 8512 with more memory and extra disc drive also available Ideal for many applications, useless for others
Cost: £399 + VAT (£499 + VAT)

AMSTRAD PC1512

Components: System unit with disc drive, keyboard monitor
Software: MSDOS, Dos Plus, Gem
CPU: Intel 8086
RAM: 512k
ROM: 1K bootstrap
Storage device: 5¼in floppy
Ports: Centronics, RS232 joystick, mouse
Sound: One channel only
Graphics: 640 × 512, 16 colours
Keyboard: Standard qwerty plus numeric keypad and 10 function
Basic: Locomotive Basic 2, running under Gem
Other languages: Practically everything
Expandability: Up to 640K under MSDOS or 8Mb using Lotus/Intel spec
Software compatibility: Practically all IBM software
Software availability: Specialists
Distributors: Most business micro distributors, many high street and independent stores
Applications: Business
For/Against: Everybody has one, everything runs on it, it's cheap The standard is five years old, and a bit dated
Other Comments: Don't fight it, it'll take over anyway
Cost: £528 entry level



Other languages Basic, Pilot, Logo, Forth, Pascal
Expandability. Top model in Atari's 8 bit range
Software compatibility: Yes with most of the lower range Atari 8 bit machines
Software availability: High street specialists, mail order
Distributors: Some high street stores, dealers
Applications Games, business, education
For/Against A vast number of American software titles available, relatively crude graphics if a useful number of colours are used
Other Comments: Cassette recorder costs £34 Various deals are being offered bundling the computer with recorder or disc drive
Cost. £135

ATARI 520 STM

Components Keyboard, 500K disc drive, mouse
Software: Gem, ST Basic, ST Logo 1st Word, Neochrome Free CP/M emulator also available
CPU 68000 (16 bit)
RAM 512K
ROM 192K
Storage device: 3½in disc drive, hard disc
Ports Midi in, Midi out, printer monitor, TV hard disc, disc drive, cartridge, modem joystick/mouse, joystick
Sound. External, three channels (AY 3 8912)
Graphics 640 × 400 – 2 colours, 640 × 200 – 4 colours 320 × 200 – 16 colours Colours selectable from 512 All modes multi colour
Keyboard 10 function, cursor/utility pad, keypad
Basic Good but has bugs and poor editor Computer Concepts Fast ST Basic cartridge vastly superior
Other languages C, Pascal, Fortran, Assembler BCPL, LISP, Cobol, RPG 2
Expandability: 1 meg upgrade, 1040 ST, 2080 ST 4160 ST
Software compatibility. Upwards
Software availability: Some high street, mail order, specialists
Distributors Specialist
Applications Business, entertainment, word processing
For/Against Very fast and powerful, lots of user memory, excellent graphics, reasonable sound, Gem desktop and mouse, Midi ability Basic degraded by bugs and poor editor
Other Comments: Ordinary monochrome monitors are incompatible due to high bandwidth of 70Mhz Atari's monitor is very high quality
Cost: £449

ATARI 130 XE

Components. Keyboard
Software: Varies
CPU: 6502
RAM 128K
ROM 24K
Storage device: Cassette, disc
Ports Cartridge serial I/O, expansion, monitor, TV, two joysticks
Sound: Four channels
Graphics 320 × 192 – 2 colours, 160 × 96 – 4 colours, 80 × 192 – 16 colours (selectable from 256), 80 × 48 – 4 colours
Keyboard: Five function keys
Basic: Adequate at best. Poor string handling

COMMODORE 64C

Components Keyboard, tape deck, mouse
Software: Cheese graphics, Pitman typing tutor, various "board" games
CPU 6502
RAM: 39K
ROM 25K
Storage device: Dedicated cassette, disc
Ports: 2 joysticks, cartridge, serial, video/audio, user/RS232, TV
Sound External, 3 channel "SID" synthesiser
Graphics: Text, multi-colour and hi-res (320 × 200) – 16 colours
Keyboard: Four function keys, plus four shifted functions





Basic. Abysmal No Basic commands for sound or graphics, though good editor Many alternatives available
Other languages Forth, Pascal, Assembler, etc
Expandability 256K pack forthcoming
Software compatibility Upwards to C128, C128D
Software availability. All high street, mail order specialists
Distributors High street specialists
Applications. Games, applications, business
For/Against· World s biggest selling micro, huge software base, good graphics and sound, many third party peripherals available Very poor Basic, often needs special interfaces for non Commodore peripherals
Other Comments The 64C is functionally identical to the old 64 After Christmas the 64C should be available outside the Compendium pack
Cost £249

COMMODORE 128D

Components: Keyboard, main unit with disc drive
Software· DOS shell, CP/M
CPU: 6502, Z80
RAM 39K in 64 mode 128K in 128 mode
ROM 25K in 64 mode 48K in 128 mode
Storage device: Built in doubled sided disc drive cassette
Ports 2 joysticks, cartridge, cassette, serial, video, TV, RGB, user/RS 232
Sound External, 8 channel "SID" synthesiser
Graphics· 64 mode, as CBM 64C 128 mode, mono text and 320 × 200 hi res 16 colours
Keyboard: Detachable with numeric keypad, extra cursor keys, eight additional control keys
Basic. In 64 mode, as CBM 64C, in 128 mode, much improved Basic V 7 0 with advanced graphics, sound and structured programming commands
Other languages In 64 mode, as CBM 64C in 128 mode, nothing
Expandability: 256 and 512K memory packs forthcoming
Software compatibility: Downwards to 64C also runs some CP/M
Software availability As CBM 64C
Distributors High street and specialist
Applications Business, 80 column word processing games
For/Against Runs 64 software, CP/M software on correct disc format, good sound, graphics fast disc drive, lots of memory But large "footprint", little dedicated 128K software, little CP/M software in right format, cost of monitor must be added to machine price
Other Comments Commodore's attempt to compete with the Amstrad PCW fails on several counts Best regarded as an upgrade for 64 owners who want more power without sacrificing their software library
Cost £499

EINSTEIN 256

Components Keyboard, colour monitor, 3in disc drive, joystick
Software: 4 games disc, CP/M, Basic
CPU Z80
RAM 256K (192K on video Ram)
ROM 16K
Storage device· disc drive, cassette
Ports· Monitor, audio out, cassette, RS232, two joystick/printer/user, Vamp edge connector
Sound Three music, one noise channel (AY 3 8912)
Graphics 512 × 212 – 16 colours from 512, 256 × 212 – 256 colours, 256 × 100 – 4 colours, multi colour modes
Keyboard. Eight function keys, cursor pad
Basic. Competent version Provision of sprite handling commands are the high spot
Other languages: BBC Basic, Logo, Assembly
Expandability· None
Software compatibility All 64K Einstein software, some CP/M, some Spectrum (with emulator)
Software availability: Specialist dealers, mail order
Distributors Specialists, Tatung (UK) Ltd, Stafford Park 10, Telford, Shrops TF3 3AB
Applications. Business, games, word processing
For/Against· Has superb graphics potential, hardware sprites, compact system No software to make use of the new graphic modes, mediocre Basic
Other Comments Good value for money but the software scene has a very patchy look to it
Cost. £399

SINCLAIR SPECTRUM PLUS 2

Components: Keyboard with cassette deck
Software: Various games packages
CPU: Z80
RAM 128K
ROM 32K
Storage device· Cassette, microdrive, disc
Ports. 2 joysticks, TV, RGB keypad, RS232, Midi out, user port, printer port
Sound: External, AY 3 8912, three voices plus noise piezo beeper in 48K mode
Graphics 256 × 192 – 8 colours
Keyboard Full travel with four cursors, extend mode, symbol shift keyword
Basic. Idiosyncratic 48K Sinclair Basic, more flexible 128K Basic with better editor
Other languages Forth, Pascal, C, Fortran etc etc
Expandability· None
Software compatibility· 90% of Spectrum 48K software, plus 128K packages
Software availability All computer dealers
Distributors: High street, specialists
Applications· Games, some business
For/Against: Huge software base, improved Basic and sound in 128K mode, good keyboard built in cassette deck, price Limited graphics, no standard fast data storage device, non standard joystick ports
Other Comments: Ties with the 64C as the games players' choice, far from ideal for any serious application, but inexpensive and well supported
Cost. £149



To PC or not to PC?

THAT IS THE QUESTION JOHN LETTICE COMES UP WITH SOME ARGUMENTS FOR AND AGAINST BUYING IBM COMPATIBLE MACHINES

If you're still wondering why you should buy a PC, award yourself ten brownie points immediately The land of mom, apple pie and the Strategic Defence Initiative may have fallen for a five year old technology, and the British software industry may be climbing onto the bandwagon (what's a BIOS, mum?) but you a least retain a healthy scepticism

But sceptic or not you ll be aware that the world and its cohabitee is going crazy about the beast, and you ll want to know what the fuss is all about

Oddly enough the daddy of the standard, the IBM PC, started off as a home computer It had a Rom Basic and a tape port (newer PCs still do) and a paltry amount of memory Its contemporaries were the ZX81, Vic 20, TI99/4A and Atari 400, and its main claim to fame was that it had a 16 bit processor, although it only had an 8 bit data bus

Since its humble beginnings the IBM PC has moved away from the home area and in the business field has seen off the Apple II, Commodore Pet and Apricot machines, along with smaller fry like the Victor Sirius and sundry other machines that ran the same MSDOS operating system but didn't pass the acid test of being IBM compatible Some of these were better machines, but they didn't have the good fortune to have the magic letters IBM on their casing

From around 1984, practically all new business computers were IBM compatible They could read IBM discs, run IBM software, and were generally both cheaper and faster than the PC, and this is where the Amstrad PC1512 comes In

Part of the secret of IBM s success has been the PC's open architecture It's easy to plug in cards, and as the operating system, MSDOS can be bought off the peg It's easy to produce a lookalike Compatible manufacturers have managed to score off IBM by using faster but compatible processors by using slightly higher technology (IBM s AT garnered hoots of derision when the first machines turned up using piggy back 64K chips instead of 256K versions) and by including IBM extras' like Centronics and RS232 ports in the basic machine price

Many of the compatible manufacturers have undercut IBM s price by putting together cheap components, but the route taken by the bigger companies Amstrad included — has involved cramming as many features as possible into as few chips as possible As it's now possible to buy an 'IBM PC on a chip Amstrad is by no means the greatest exponent of this, but its PC does have a very small chip-set

Because of the number of years the IBM standard has been around it isn't in the forefront of technology The basic chip, the Intel 8088, is no sprinter and although the upgraded 8086 is faster it still doesn t rival the 68000 The IBM's standard graphics are frankly laughable, and the company's upgrade, the Enhanced Graphics Adaptor (EGA) is not widely regarded as the perfect solution

Olivetti, Compaq and Amstrad use non standard graphics, but although this improves the screen handling it can cause compatibility problems Amstrad's display is highly compatible given those problems, but as most software will be written for the IBM first it's unlikely that much of it will take advantage of the Amstrad's ability to put 16 colours on screen at one time

So although the PC's graphics may be comparable to those on other business machines they're inferior to those produced by many home machines Despite these limitations the US software industry has risen to the occasion and produced large quantities of very good games software for the PC If, however, you were thinking of spending around $500 on a games machine, apart from wanting your head examined, you'd probably be better advised to go for an ST

The PC s advantage lies more in its serious software base and practically every best selling word processing, database or spreadsheet program written over the past few years has been issued for the IBM PC Because of the amount of effort that s been expended on the standard, this vast body of software includes most of the best programs in the field and while many of them currently cost an arm and a leg, the falling price of the hardware is bringing down the software prices

But the decision on whether to buy or not still comes down to what you want from a machine If you simply want a machine that will do basic business tasks adequately you might find yourself better off with an Amstrad PCW which taking the printer into account is currently £150 £200 cheaper than the PC If on the other hand you need compatibility with an office machine, or you just want to keep pace with the software that's going to be coming out over the next year or so, the extra money for the PC might be a wise investment

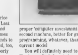
If state of the art technology is your scene, forget it, if not, consider a PC clone

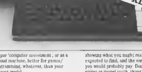
But don't go buying one just because everyone else is doing it ◀

The living dead

ZOMBIE MACHINES – DEAD, YET THEY STALK OUR HIGH STREETS! CHRISTINA ERSKINE ENTERS THE MICRO TOMB IN SEARCH OF BARGAINS

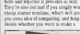
In addition to the mainstream micros available in various bundles or 'compendia' this Christmas, there are also opportunities to pick up, often very cheaply older machines which are no longer manufactured Go on a tour of your local chainstores or computer shops, and you will come across 48k Spectrums, MSXs, QLs and Plus/4s, selling for a fraction of their original price Ideal bargains if you just want a starter machine, or want a computer for a specific purpose Or are they?





Defunct but defiant Atari XL

Certainly, success at the budget price level can extend the lives of micros Last Christmas, up to 100,000 Electrons and C16s were sold The software companies took note, and many turned their hands to publishing programs, often low priced, too, for what had previously been two poorly supported computers



However discontinued computers at a knock-down price must be treated with a very large dose of caution It can be a good idea if you want the computer for one specific use only, and therefore have no reason to splash out on, say, a Commodore Compendium, with all the bells and whistles it provides as well They're also not bad if you simply want a cheap starter machine, which will give you some idea of computing, and help you decide whether you want to make a proper 'computer investment', or as a second machine, better for games/programming, whatever, than your current model

You will definitely need to shop around The larger High Street chain stores Boots, Smith's, Lasky s, et al – tend only to stock the newer machines (PCWs, CPC 6128 and 464, Spectrum Plus 2, Atari ST, and Commodore 64c), although Dixons has a wide selection, such as the Acorn Electron at £79 99, the Atari 800XL at £69 99 and the QL at £119 99 It's the smaller consumer electronics chains, and the independent computer stockists which are more likely to sell the bargains

So, what can you get, and how much use is it going to be? Below is a table showing what you might reasonably be expected to find, and the sort of prices you would probably pay Don't take the prices as gospel truth. though – these machines have no recommended retail price, and the shops will quote a price they think people will pay The prices given below are only approximate

This is one area of Britain retailing where you can try haggling – after all, any shop is going to be quite keen to get rid of a three year old Vic 20, so you may be able to knock the price down still further If the computer has POA on the tag this means Price on Application, which goes on to mean you and the retailer coming to a mutually beneficial agreement

All these computers have both advantages and disadvantages

The Spectrums, CPC664, old-style C64 and Vic 20 have simply been superseded by their successors With the exception of the Vic, they have excellent software bases There are still plenty of alternative keyboards available for the Spectrum (Saga Systems' range, for instance) which could make a good later buy if you decide to stick to the Spectrum The Spectrum 128s that are still around only have a price advantage of about £30 on the new Spectrum Plus 2 so may not be that good a bargain, but rubber keyed versions can be picked up for a song

Despite all the furore surrounding the dropping of the CPC664, it will still happily run 99% of Amstrad CPC disc software, of which there is now a considerable amount However, it is difficult to find 664s, and the price



Dead flesh lives! Spectrum 48K



reduction is not generally staggering

The old style Commodore 64 has an excellent and very varied software base, the best counsel here, however, is probably to wait. As Commodore concentrates on the 64c, prices for the discontinued version may well fall.

On the others, it is best to match the computer to your needs. A Commodore 16, for example, could make a good introduction to computing for a young child, with its good – and cheap – arcade style games catalogue. But the recipient will probably grow out of it quite quickly, and require something more advanced.

No one who is considering buying a micro could fail to be aware of the controversy which surrounded the QL, while this, the idiosyncrasy of microdrive cartridges and the, er, unusual keyboard may put you off, there is a fair amount of good serious software for the machine, particularly in the field of computer languages.

With every machine listed (and who knows, you may come across a Dragon or TI99/4A for next to nothing, and the same applies) caution is the best approach. If the computer breaks, it may be very difficult to get parts, new software will be very thin on the ground and the existing catalogue may look horribly dated. But, better to pick up a rubber keyed Spectrum for £50 to experiment and find out what you want to get out of computing than splash out almost £1000 on an Atari 1040ST, only to discover you really wanted infinite lives on Jet Set Willy ◀

Machine	Availabtlity	Approx. Price	Comments
Spectrum 48 (rubber keys)	Quite a few still around	£40 £90	Can add better keyboard later; large software base
Spectrum Plus	Lots around	£80–£100	As above
Spectrum 128	Widely available	£120	As above, plus possibly worth waiting for further discounts
Commodore Vic 20	Very rare	£30–£80	Very dated, no new software products
Commodore 64 (old casing)	Widely available	£100 £200*	Old, but 64c enhancements are largely cosmetic. Possibly worth waiting for further discounts. Huge software base and peripheral choice
Commodore 16	Quite a few still around	£40–£80	Good budget games software base, good basic
Commodore Plus/4	Lots around	£40–£100	Will run C16 software, little dedicated Plus/4 software
Amstrad CPC664	Very rare	£250+ b/w £300+ col	Plenty of CPC disc software now available
MSX	Quite a few of most brands available	£50–£100	Reasonable games base, disc drive very expensive
Sinclair QL	Quite a few still around	£100+	Unpopular Microdrive storage system, good selection of serious software
Atari XL	Getting rarer	£40–£80	Software base never reflected machine's capabilities

*Some of the old 'bundles' can still be found, eg, the Music Pack (with keyboard, Sound Expander, and C2N at £299.99) Try branches of W H Smith.

SPECTRUM REPAIRS
ONLY ONE COMPANY OFFERS

- Over 15 years computer maintenance experience on all types of systems from Mainframes to Micros
- We repair **ALL** Spectrums sent to us. Not only the profitable ones. **IF** they are sent to us first. We receive many that have been tampered with by other repair companies and returned to their owners unrepaired – often further damaged by an attempted repair
- An honest six months parts and labour written guarantee on the **WHOLE** computer – not only on the fault repaired – read the other adverts carefully
- Free update and overhaul with each repair – it is in both our interests for your computer to be reliable
- **NO** "FREE" games – your money is best spent on top quality components and professional computer engineers
- All Spectrums are returned fully insured by 1st Class post. Normally within 24 hours – please do not send power supplies
- All-inclusive price of £20 or £15 without update and guarantee regardless of the number of faults found

R P Computer Maintenance,
The Laurels (Dept 1),
Wendling, Dereham,
Norfolk NR19 2LZW

Tel: 036287 327





SPECIAL OFFERS FOR AUTUMNAL EVENINGS IN FRONT OF YOUR MICRO ! ! !

USED GOODIES'

COMMODORE 64	£99.00	COMMODORE C2N	£21.00
EPSON MX70 PRINTER	£85.00	SHINWA CP80	£90.00
COMMODORE 1701 MONITOR	£80.00	COMMODORE MPS801	£80.00
INTEVAN 1550 15" PRINTER	£250.00	APRICOT F1	£199.00
APRICOT 9" MONITOR	£75.00	BROTHER HR15 XC	£149.00
APPLE II EUROPLUS FROM	£75.00	APPLE DISC DRIVE	£90.00

OLIVETTI M20 COMPLETE MONITOR 256K WP SPREADSHEET MODEM AND COMMS SOFTWARE, ONLY £280.00

N.B. We always want to buy good used gear but we'd rather give you more in part-exchange

NEW GOODIES'

ROTRONICS CASSETTE RECORDER FOR MOST COMPUTERS (ESPECIALLY FOR COMMODORE. COMES WITH BUILT-IN C2N EMULATION) £15.95
COMMODORE TAPE INTERFACE (FOR MOST RECORDERS) £3.95

4IC A.D UPGRADES	£19.00	2001 CENT I/F	£5.95
INTERSEM FOR PCW	£89.95	100 CAP DISC BOX	£0.95

SAGE MODEM + CHITCHAT FOR AMSTRAD PCW £159.95

N.B. We can supply most new Micros and peripherals. talk to us!

ONCE BYTTEN DISCS (BY ATHANA AND VERBATIM)
With labels and hub ringed (5¼" with sleeves)

	10 Boxed in library case	25 Loose	50 Loose	100 Loose
5¼" SSDD 96tpi	£8.50	£14.95	£27.50	£50.00
5¼" DSDD 96tpi	£9.50	£17.95	£32.50	£90.00
3½" SSDD 135tpi	£15.95	£37.95	£72.50	£139.00
3½" DSDD 135tpi	£19.95	£46.95	£89.95	£169.00

3" DSDD Discs (by Maxell) £3.90 each or Box of 5 for £17.95

QUICKSHOT II JOYSTICK (THE CLASSIC) £8.95 INC P&P

* Post and Packing within the U.K. as follows
Computers £5. Monitors £5. Printers £10. Disc Drives £3
Small Accessories £1. Discs FREE! ! !
Overseas orders welcomed, please ask for quotation

STOP PRESS ! ! ! (Well, slow it down anyway)

All the above offers are now available to callers at our only Central London stockist: VIC ODDEN'S LTD, 45 London Bridge Street, SE1 (London Bridge Station forecourt). Telephone Keith McCarron on 01 407 1447 to check availability.

Apologies: our normal Mail Order address was missing from last weeks advertisement. All Mail Order enquiries to:
ONCE BYTTEN 31 Bowness Road, London SE6 2DG

Why do you suppose there's an ST in ChriSTmos?

Atari ST's make fantaSTic presents for

ArtiSTs, prieSTs, STudents, SToremen, STrippers

in fact whatever your profession the Atari ST range is made for

YOU

We've got STockings full of software too!

Phone us now for out loteST STupendous prices

Wishing our customers throughout the world a HAPPY ST CHRISTMAS

Part Exchange and Finance Available

BATH COMPUTER SHACK	TROWBRIDGE COMPUTER SHACK
8E Chelsea Road	8 Timbrell Street
Lower Weston, Both, Avon	Trowbridge, Wilts
Tel: 0225 310300	Tel: 02214 67299

Some consolation

CHRIS JENKINS ON THE UNEXPECTED RETURN OF THE DEDICATED GAMES CONSOLES TO THE CONSUMER MARKET

History, they say, repeats itself When Nolan Bushnell's original arcade ping pong game was reduced to the size of a box of chocolates the games console was born, and now, after some years in the wilderness, it looks as if the concept is to be reborn in a more sophisticated form

Games consoles are, of course, in effect computers without the interactive element You can't write a program on a games console it doesn't have a keyboard But inside are all the elements of a true computer, RAM, ROM, video handling sound generators, and so forth

The argument in favour of games consoles is that they are cheap, because they cut out so many of the elements of a true computer, like the keyboard, disc drive, printer, monitor, large RAM and because they use cartridges or data cards rather than tape or disc storage, they are easy to use

The games console is ideal if you have admitted to yourself, as so many computer users have that the promise of being able to write your own programs in Basic or machine code is a delusion, most of us are never going to be able to write adequate commercial standard programs, so why bother trying? It's like buying a fitted kitchen when all you can cook is frozen beefburgers

Now that RAM and ROM chips are cheap enough to give a games console the same sort of power as a computer, and now that the initial excitement of grappling with programming has dulled into indifference, the time is ripe for the games console to return

So what is on the market? So far, only one system, the Atari 7800, replacement for the aged Atari 2600 However, before Christmas there should be two competitors, the Sega system from Ariolasoft and the Nintendo from Mattel, whose own Intellivision system nearly brought the corporation to its knees in the boom years

Atari's 7600 is £69 95, runs 2600 programs, and can be used with Atari joysticks, paddles, track balls and touch pads The Nintendo and Sega machines, though, threaten to outperform Atari—although they will cost somewhat more

Sega's console will cost around £100, and consists of a main unit, power supply and two control units These include two fire buttons and a mini joystick The central processor is the Z80 found in the Spectrum and Amstrad machines, although there's a custom video chip offering 32 colours from a palette of 64



with 256×192 pixel resolution The familiar AY 3 8910 four voice sound chip (as in the Spectrum Plus 2, Amstrad CPC et al) is also included, and there are 32 hardware sprites and hardware scrolling routines

Needless to say there's little more to add, the virtue of the games console is its simplicity Slots for cartridges, Astron data, cards, and ports for TV, monitor and sound complete with line up

Cartridges available for the Sega have 128K capacity, while Astron cards—credit card sized plastic strips—have 32K capacity Both cost around £19 95 For some of the details on games available at the launch of the Sega system, see *Popular*, 23 October 1986

The Nintendo system, distributed by Mattel, looks more ambitious, but in danger of losing the virtue of simplicity Due to be launched early next year, the Nintendo may cost up to £150, with cartridges at around £30 – although the success or otherwise of the Sega may affect the price

The Nintendo system contains proprietary chips which produce video displays featuring 52 colours It comes complete with two control cards, similar to the Sega system's, which feature two fire buttons and a thumb-pad each There's also a light sensing pistol the Zapper, which works like a light pen, and R O B , a miniature robot which can be plugged into the console and used as a partner for games, or made to perform up to 60 actions in strings of 100 commands The gun and robot are, of course, optional extras, the basic system consists of the control deck, two cards and one game cartridge

Nintendo software is arranged in a number of different series, sports, light gun, robot, educational, action, arcade conversions and so on There's even a programmable series, where the obstacles can be varied to your own taste In all, 27 titles have been announced so far

In Japan and the USA, games consoles such as the Sega, Atari and Nintendo are already making a big comeback With the home computer field going up-market, moving on to the 68000 based Atari ST s, there is now a gap at the low end of the market which mass produced, cheaply assembled games consoles could fill Although there isn t a quantum leap in quality between 8 bit micros and game the new games consoles – as there is between 8 and 16 bit computers – it may well be that the non technical camp will defect from computers to consoles Put another way, if all you are looking for is fast moving, colourful arcade games looking as much as possible like the coin-op originals, then a console may be your best choice ◀



Xen Plus

Simon Goodwin

Xen Plus is a follow up to the Xen extension program for the Amstrad CPC s computers which concentrates on graphics and screen manipulation and provides 13 further commands in less than 2K

The commands are as follows

|*Help1* lists all new commands

|*VDU x* provides a BBC like *VDU* command For example |*VDU 23 1* turns on the graphic *XOR* function

|*Scrswep n* allows screen memory to be moved around Ram When n=1 screen Ram is set to 16384 Setting n to zero reverts to normal

|*Upnnt x y @a$* underlines the text in a$ at graphics coordinates x y

|*Emphasise x y @a$* outputs text in an emphasised form

|*Dotline n direction* draws a dotted line n pixels long in one of four directions (0 to 3)

|*Scrfacts* gives a run down of graphice and text co ordinates pen and paper and screen mode

The remainder of the listing and instructions will be given next week

```
10 REM XEN PLUS BY SIMON.T GOODWIN
20 REM
30 FOR n=39000 TO 40530
40 READ a$
50 POKE n,VAL("&"+a$)
60 count=count+VAL("&"+a$)
70 NEXT
80 IF count <>163646 THEN PRINT "DATA ERROR":END
90 CALL 39000
100 DATA 00,00,00,00,3E,01,CD,0E
110 DATA BC,01,99,99,21,56,98,CD
120 DATA D1,9C,DD,21,FB,96,06,1B
130 DATA CD,6F,9C,CD,25,9C,DD,21
140 DATA 13,99,06,18,CD,6F,9C,CD
150 DATA 25,9C,CD,25,9C,CD,25,9C
160 DATA C9,B2,98,C3,5A,98,C3,D8
170 DATA 98,C3,30,9C,C3,7B,9B,C3
180 DATA BC,99,C3,A8,9A,C3,95,9A
190 DATA C3,C7,9C,C3,3F,99,C3,A5
200 DATA 99,C3,31,99,C3,3F,9D,C3
210 DATA 32,9D,56,44,D5,4E,4D,50
220 DATA 48,41,53,49,5A,C5,48,45
230 DATA 4C,D0,55,50,52,49,4E,D4
240 DATA 53,43,52,46,41,43,54,D3
250 DATA 44,4F,54,4C,49,4E,C5,53
260 DATA 43,52,53,57,41,D0,44,50
270 DATA 52,49,4E,D4,47,43,4F,4F
280 DATA 52,C4,54,43,4F,4F,52,C4
290 DATA 42,4F,D8,50,55,D4,53,49
300 DATA 5A,C5,FF,58,45,4E,20,50
310 DATA 4C,55,53,20,56,31,2E,30
320 DATA 20,41,63,74,69,76,61,74
330 DATA 65,64,2E,53,69,6D,6F,6E
340 DATA 2E,54,2E,47,6F,6F,64,77
350 DATA 69,6E,20,31,39,38,36,20
360 DATA 20,20,20,00,00,00,00,00
370 DATA 00,DD,6E,00,DD,66,01,22
380 DATA 2E,99,CD,C6,BB,ED,53,1E
390 DATA 9C,22,20,9C,CD,53,2D,99
400 DATA 22,2F,99,2A,28,99,19,EB
410 DATA 2A,20,9C,CD,F6,BB,CD,C6
420 DATA BB,EB,53,1E,9C,22,20,9C
430 DATA ED,5B,28,99,19,ED,5B,1E
440 DATA 9C,CD,F6,BB,CD,C6,9B,ED
450 DATA 53,1E,9C,22,20,9C,EB,ED
460 DATA 5B,28,99,ED,52,EB,2A,20
470 DATA 9C,CD,F6,BB,ED,5B,2D,99
480 DATA 2A,2F,99,CD,F6,BB,C9,DD
490 DATA 6E,04,DD,66,05,DD,5E,02
500 DATA DD,56,03,CB,3C,CB,1D,CD
510 DATA 1D,BC,10,0C,C9,DD,6E,02
520 DATA DD,66,04,2D,25,CD,1A,BC
530 DATA DD,5E,00,DD,56,01,7D,12
540 DATA 13,7C,12,C9,CD,25,9C,CD
550 DATA 25,9C,DD,21,4F,9A,06,11
560 DATA CD,6F,9C,CD,C6,BB,D5,CD
570 DATA 29,9B,D1,3E,2C,CD,5A,BB
580 DATA EB,CD,29,9B,CD,25,9C,DD
590 DATA 21,60,9A,06,0D,CD,6F,9C
600 DATA CD,78,BB,7C,32,4D,9A,7D
610 DATA 32,4E,9A,3A,4D,9A,6F,26
620 DATA 00,CD,29,9B,3A,4E,9A,6F
630 DATA 26,00,3E,2C,CD,5A,BB,CD
640 DATA 29,9B,CD,25,9C,DD,21,6D
650 DATA 9A,06,0C,CD,6F,9C,CD,93
660 DATA BB,6F,26,00,CD,29,9B,CD
670 DATA 25,9C,DD,21,79,9A,06,0E
680 DATA CD,6F,9C,CD,99,BB,6F,26
690 DATA 00,CD,29,9B,CD,25,9C,DD
700 DATA 21,87,9A,06,0C,CD,6F,9C
710 DATA CD,11,BC,6F,26,00,CD,29
720 DATA 9B,CD,25,9C,C9,0A,00,47
730 DATA 52,41,50,48,49,43,53,20
740 DATA 43,6F,2D,6F,72,64,73,20
750 DATA 54,45,58,54,20,43,6F,2D
760 DATA 6F,72,64,73,20,43,55,52
770 DATA 52,45,4E,54,20,50,45,4E
780 DATA 20,43,55,52,52,45,4E,54
790 DATA 20,50,41,50,45,52,20,53
800 DATA 43,52,45,45,4E,20,4D,4F
810 DATA 44,45,20,00,0A,DD,7E,00
820 DATA FE,00,28,05,FE,01,28,06
830 DATA C9,3E,C0,C3,08,9C,3E,40
840 DATA C3,0F,9C,DD,4E,02,DD,46
850 DATA 03,DD,7E,00,32,28,9B,ED
860 DATA 43,26,9B,CD,C6,BB,ED,53
870 DATA 1E,9C,22,20,9C,CD,EA,BB
880 DATA ED,4B,26,9B,11,04,00,CD
890 DATA 90,9C,C5,CD,E7,9A,ED,5B
900 DATA 1E,9C,2A,20,9C,CD,EA,BB
910 DATA C1,0B,78,B1,20,EC,C9,4A
920 DATA 28,9B,FE,00,28,2B,FE,01
930 DATA 28,1A,FE,02,28,0B,2A,20
940 DATA 9C,2B,2B,2B,2B,22,20,9C
950 DATA C9,2A,20,9C,23,23,23,23
960 DATA 22,20,9C,C9,ED,5B,1E,9C
970 DATA 1B,1B,1B,1B,ED,53,1E,9C
980 DATA C9,ED,5B,1E,9C,13,13,13
990 DATA 13,ED,53,1E,9C,C9,00,00
1000 DATA 00,CB,7C,28,0C,3E,2D,CD
1010 DATA 5A,BB,EB,21,00,00,A7,ED
1020 DATA 52,0E,0A,1E,00,3E,00,06
1030 DATA 10,29,17,B9,38,02,91,2C
1040 DATA 10,F7,1C,F5,7C,B5,20,ED
1050 DATA 43,F1,C6,30,CD,5A,BB,10
1060 DATA F8,C9,FE,01,28,09,3D,47
1070 DATA DD,23,DD,23,10,FA,3C,47
1080 DATA DD,7E,00,C5,DD,E5,CD,5A
1090 DATA BB,DD,E1,C1,DD,2B,DD,2B
1100 DATA 10,EE,C9,CD,C3,9B,DD,5E
1110 DATA 04,DD,56,05,DD,6E,02,DD
1120 DATA 66,03,ED,53,1E,9C,22,20
1130 DATA 9C,CD,C0,BB,3A,22,9C,47
1140 DATA DD,2A,23,9C,CD,0B,9C,2A
1150 DATA 20,9C,06,10,2B,10,FD,ED
1160 DATA 5B,1E,9C,CD,C0,BB,21,00
1170 DATA 00,11,10,00,3A,22,9C,47
1180 DATA 19,10,FD,EB,21,00,00,CD
1190 DATA F9,BB,C9,DD,6E,00,DD,66
1200 DATA 01,7E,32,22,9C,23,7E,32
1210 DATA 23,9C,23,7E,32,24,9C,C9
1220 DATA CD,C3,9B,3E,17,CD,54,BB
```

Programming: QL

3D Rotator

John Owen

This program draws a tetrahedron and then rotates it in three dimensions The program can easily be modified to rotate another object

Line 480 holds the object s point each specified by x y and z co-ordinates respectively From each point to the next a line is drawn

The variable *p* in line **100** indicates the number of points

As the listing is fairly short it can be easily incorporated into your own programs to provide displays for a variety of applications, including games

```
10 REMark tetrahedron rotation        J.R.J.
100 p=4 : REMark no. points
110 DIM x(p) y(p) z(p)
[illegible] m 2( n=100 [illegible]
130 scrn
140 ad 5
150 c= COS(RAD(ad)) : s=SIN(RAD(ad))
160 REPeat plt
170   draw : rot
180 END REPeat plt
190 :
200 :
210 DEFine PROCedure draw
220 CLS
```

```
230 t=m m/(n y(1))        LINE t*x(1),t*12*(1) [illegible]
240 FOR i=2 TO p
250   t=(m m/(n y(i))
260   [illegible] : t*t*(z(i)) t*r      LINE TO a b
270 NEXT
280 END DEFine draw
290 :
[illegible]
300 DEFine PROCedure rot
320 FOR i=1 TO p
330   [illegible]
340   x(i) [illegible] y(i) [illegible] s+c*y( )
350 NEXT i
360 END DEFine rot
```

```
370
380
390 DEFine PROCedure [illegible]
400 MODE [illegible] : SCALE [illegible]
410 INK 7 : PAPER 0 [illegible]
420 [illegible]
430 RESTORE
440 FOR i=1 TO p
450   READ a,b[illegible]
460   x(i)=a : y(i)=b : z(i)=c
470 NEXT i
480 DATA -50 0 300 100 20 350 70 [illegible] 300
490 90 450 [illegible] 100 20 350 70 -4[illegible] [illegible] 45
499 END DEFine scrn
```

Programming: Commodore 64

U.F.O.

Steven Pattullo

Controlling your spaceship is by using a joystick plugged in port two. Moving the joystick up and down results in your spaceship following suit. *Left* slows you down while *right* speeds you up. The fire button launches the missile.

There are three listings in all for UFO. They must be saved in order for the program to run correctly. If you don't want to type it in send £2 (or £1.30 plus cassette) to Steven Pattullo, 34 Birchfield Road, Widnes, Cheshire WA8 7SU.

```
10 V=53248 [illegible] H$=[illegible] TE PATTULLO
11 FOR N=S TO [illegible]+54 POKE N,0 NEXT POKE [illegible]+24 [illegible] =0
12 POKE S+5 1?5 POKE S+6 255 T=100
20 POKE V+22 24 POKE 5[illegible] [illegible]
30 POKE 53280 0 POKE 53281 0
40 PRINT "[illegible]"
50 POKE 53[illegible]2,14 POKE 5[illegible] 1
60 PRINT "[illegible]"
70 POKE 2040 24[illegible] POKE 2041 24[illegible] POKE 2042 244
80 POKE V+39,7 POKE V+40 7 POKE V+41,7
90 POKE V+[illegible] 2 POKE V+[illegible] 1
95 POKE V+2[illegible] [illegible]-32
100 PRINT "[illegible]"
110 FOR H=1 TO 22
120 PRINT "[illegible]" NEXT
130 PRINT "[illegible]"
140 PRINT "[illegible]"
150 PRINT "[illegible]"
160 PRINT "[illegible]"
170 PRINT "[illegible]"
180 PRINT "[illegible]"
190 PRINT "[illegible]"
200 PRINT "[illegible]"
210 PRINT "[illegible]"
220 PRINT "[illegible]"
230 PRINT
240 PRINT "[illegible]"
250 PRINT "[illegible]"
260 PRINT "[illegible]"
270 PRINT "[illegible]"
280 PRINT "[illegible]"
290 PRINT "[illegible]"
300 PRINT "[illegible]"
305 PRINT "[illegible]PROGRAMMED BY S PATTULLO[illegible]"
307 PRINT "[illegible]PRESS 1 FOR INFORMATION[illegible]"
310 PRINT "[illegible]"
```

```
320 FOR N=628 TO 708 POKE N,1 NEXT
330 POKE 704,255 POKE 705,0 POKE 706,255 POKE 707,0 POKE 708 255 POKE 709,0
340 POKE V+16 7
345 POKE V+23,7 POKE V+29 7
350 POKE V+1 150 POKE V,50
360 POKE V+3,150 POKE V+2 100
370 POKE V+5 150 POKE V+4,150
380 POKE V+21 7
390 SYS 49152
471 POKE S+4,17
472 READ X,Y,Z IF X=-1 THEN RESTORE GOTO 471
473 POKE S+1 X POKE S Y
490 FOR N=1 TO Z+15 NEXT
491 GET A$
492 IF A$="I" THEN GOTO 4000
500 IF PEEK(56320)<>111 THEN GOTO 471
510 POKE V+30 0 POKE S+24 0 GOTO 1000
600 REM ****JOYSTICK READ*****
610 IF J=126 THEN POKE 714,1 POKE 715,255 POKE 706 1 POKE 707,255
620 IF J=125 THEN POKE 706 1 POKE 707,1 POKE 714,1 POKE 715,1
630 IF J=123 THEN A=A+1
640 IF J=119 AND A>1 THEN A=A-1
660 RETURN
700 REM **CHECK COLLISIONS**
705 O=PEEK(V+30) P=PEEK(V+31)
710 POKE V+30 0 IF (O)AND2)=2 THEN GOTO 7000
720 IF ((P)AND2)=0THEN GOTO 7000
725 X=INT(RND(0)*4)
726 IF X=1 THEN POKE 708 255 POKE 709 1 POKE 710,255 POKE 711 255
727 IF X=2 THEN POKE 706 255 POKE 709 255 POKE 710 255 POKE 711 0
728 IF X=3 THEN POKE 709,255 POKE 708,0 POKE 710,255 POKE 711 1
750 IF P=1 THEN POKE 53281,X+2 POKE 53280 X+2
755 T=T-1 IF T<0 THEN T=0
760 J=PEEK(56320) IF J<>127 THEN GOSUB 600
790 RETURN
900 POKE V+16,220 O=PEEK(V+30) POKE 0 0
905 SC=SC+T T=100
910 POKE V+2,40 POKE V+5 110 POKE V+4 180 POKE V+7 140 POKE V+6,200
920 POKE V+9 170 POKE V+8 160 POKE V+10,60 POKE V+21 254 POKE 0 0 RETURN
1000 POKE V+23 0 POKE V+29 0 POKE V+21 0 PRINT "" PRINT ""
1001 FOR N=S TO S+24 POKE N,0 NEXT POKE 49326,65 POKE 49331 10
1002 PRINT SPC(15) "GET READY" FOR N=1 TO 5 SYS49200 NEXT PRINT ""
1005 POKE 2041,240
1010 POKE 2042,245 POKE 2043,245 POKE 2044,245
1015 POKE 704,0 POKE 705 0 POKE 706 0 POKE 707 0
1020 POKE 708 255 POKE 709 0 POKE 710 255 POKE 711,0 POKE 712 255 POKE 713,0
1025 POKE V+42,7 POKE V+43 7
1030 A=1
1100 REM ***LEVEL ONE***
1105 PRINT ""
1110 PRINT "♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬♠|¬"
1115 FOR N=1 TO 10
1120 PRINT "" NEXT
1125 PRINT "||_||_||_||_||_||_||_||_||_||_||_||_||_"
1130 POKE V+40,15 POKE 2045,251 POKE V+44 0
1131 POKE V+30,0
1145 POKE V+3,140 POKE V+11 155
1160 GOSUB 900
1170 POKE 690,A POKE 696 A
1173 GOSUB 700
1175 J=PEEK(56320)
1180 IF J<>127 THEN GOSUB 600
1190 IF J=127 THEN POKE 706 1 POKE 707,0 POKE 714,1 POKE 715,0
1205 IF (PEEK(V+16)AND2)=2 AND PEEK(V+2)>80 THEN GOTO 1300
1210 GOTO 1170
1300 POKE V+21,0 PRINT ""
```

Fonts

R Groom

The character expander will work in any graphics mode and is used as follows

Proc_EXPAND(x y a g w d s)

Where *x* and *y* are the graphics co ordinates *a* is the Ascii code of the letter *w* is the pixel width *d* is the pixel depth *g* is the colour as used with *Gcol* and *s* is the slant of the letter which can be positive or negative

If you would like a copy send £3 and a tape to R Groom, 106 Ingles Welwyn Garden City Herts AL8 7HG

```
1240JSRcall
1250LDA#23:JSRC%
1260LDA#255:JSRC%
1270LDA&71:JSRC%:JSRC%:JSRC%:JSRC%
1280LDA&72:JSRC%:JSRC%:JSRC%:JSRC%
1290LDA#255:JSRC%
1300LDA#10:JSRC%
1310LDA#8:JSRC%
1320LDA#23:JSRC%
1330LDA#255:JSRC%
1340LDA&73:JSRC%:JSRC%:JSRC%:JSRC%
1350LDA&74:JSRC%:JSRC%:JSRC%:JSRC%
1360LDA#255:JSRC%
1370LDA#10:JSRC%
1380LDA#8:JSRC%
1390LDA#23:JSRC%
1400LDA#255:JSRC%
1410LDA&75:JSRC%:JSRC%:JSRC%:JSRC%
1420LDA&76:JSRC%:JSRC%:JSRC%:JSRC%
1430LDA#255:JSRC%
1440LDA#10:JSRC%
1450LDA#8:JSRC%
1460LDA#23:JSRC%
1470LDA#255:JSRC%
1480LDA&77:JSRC%:JSRC%:JSRC%:JSRC%
1490LDA&78:JSRC%:JSRC%:JSRC%:JSRC%
1500LDA#255:JSRC%
1510RTS
1520\THIS GIVES OCTUPLE HEIGHT
1530.oct
1540JSRcall
1550LDX#0
1560.loop2
1570LDA#23:JSRC%
1580LDA#255:JSRC%
1590LDA&71,X
1600JSRC%:JSRC%:JSRC%:JSRC%
1610JSRC%:JSRC%:JSRC%:JSRC%
1620LDA#255:JSRC%
1630LDA#10:JSRC%
1640LDA#9:JSRC%
1650INY:CPY#8
1660BNEloop
1670RTS
1680]
1690ENDPROC
1700:
1710DEFPROC_FUNT(X%,Y%,T$,N%)
1720FORL%=1TOLENT$
1730?&70=ASC(MID$(T$,L%,1))
1740VDU31,X%+L%,Y%
1750IFN%=1CALLupside
1760IFN%=2CALLleft
1770IFN%=3CALLright
1780IFN%=4CALLbendl
1790IFN%=5CALLbendr
1800IFN%=6CALLdouble
1810IFN%=7CALLquad
1820IFN%=8CALLoct
1830NEXTL%:ENDPROC
1840:
1850DEFPROC_EXPAND(xpos%,ypos%,asc%,gcol%,width%,depth%,slant%)
1860FORA%=0TO9:FORB%=0TO9:grid%(A%,B%)=0:NEXTB%,A%
1870?&70=asc%:CALLcall
1880width%=width%DIV8
1890depth%=depth%DIV8
1900count%=1
1910REPEAT
1920IF?(&70+count%)>=128?(&70+count%)=?(&70+count%)-128:grid%(1,count%)=1
1930IF?(&70+count%)>=64?(&70+count%)=?(&70+count%)-64:grid%(2,count%)=1
1940IF?(&70+count%)>=32?(&70+count%)=?(&70+count%)-32:grid%(3,count%)=1
1950IF?(&70+count%)>=16?(&70+count%)=?(&70+count%)-16:grid%(4,count%)=1
1960IF?(&70+count%)>=8?(&70+count%)=?(&70+count%)-8:grid%(5,count%)=1
1970IF?(&70+count%)>=4?(&70+count%)=?(&70+count%)-4:grid%(6,count%)=1
1980IF?(&70+count%)>=2?(&70+count%)=?(&70+count%)-2:grid%(7,count%)=1
1990IF?(&70+count%)>=1?(&70+count%)=?(&70+count%)-1:grid%(8,count%)=1
2000count%=count%+1
2010UNTILcount%=9
2020xstore%=xpos%
2030GCOL0,gcol%
2040FORA%=1TO8
2050xstore%=xstore%+slant%
2060xpos%=xstore%
2070FORB%=1TO8
2080IFgrid%(B%,A%)=1MOVExpos%,ypos%:MOVExpos%,ypos%-depth%:PLOT85,xpos%+width%,ypos%:PLOT85,xpos%+width%,ypos%-depth%
2090IFgrid%(B%-1,A%)=1ANDgrid%(B%,A%-1)=1MOVExpos%,ypos%:MOVExpos%,ypos%-depth%DIV2:PLOT85,xpos%+width%DIV2,ypos%:PLOT85,xpos%+width%DIV2,ypos%-depth%DIV2
2100IFgrid%(B%+1,A%)=1ANDgrid%(B%,A%-1)=1MOVExpos%+width%DIV2,ypos%:MOVExpos%+width%DIV2,ypos%-depth%DIV2:PLOT85,xpos%+width%,ypos%:PLOT85,xpos%+width%,ypos%-depth%DIV2
2110IFgrid%(B%-1,A%)=1ANDgrid%(B%,A%+1)=1MOVExpos%,ypos%-depth%DIV2:MOVExpos%,ypos%-depth%:PLOT85,xpos%+width%DIV2,ypos%-depth%DIV2:PLOT85,xpos%+width%DIV2,ypos%-depth%
2120IFgrid%(B%+1,A%)=1ANDgrid%(B%,A%+1)=1MOVExpos%+width%DIV2,ypos%-depth%DIV2:MOVExpos%+width%DIV2,ypos%-depth%:PLOT85,xpos%+width%,ypos%-depth%DIV2:PLOT85,xpos%+width%,ypos%-depth%
2130xpos%=xpos%+width%
2140NEXTB%
2150ypos%=ypos%-depth%
2160NEXTA%
2170ENDPROC
```

Fractal Geometry

D G Nevill

This QL routine generates a complex surface which can be used as a base for landscapes in games programs

The procedure requires three points to be specified to define a starting triangle (x1 y1 z1 x2 y2 z2 x3 y3 z3) and the depth of recursion (the bigger the value of 7 the more complex the resulting shape)

The surface is generated by dividing a triangle into four triangles and distorting the height. This is then repeated for each of the resulting four triangles

```
1360 DEFine PROcedure Landscape(1 x1 y1 z1 x2 y2 z2 x3 y3 z3)
1370 LOCal x4 x5 x6 y4 y5,y6 z4 z5 z6
1380 IF 1 1 THEN
1390   LINE x1+y1/2 z1+y1/2 TO x2+y2/2 z2+y2/2 TO x3+y3/2 z3+y3/2 TO [illegible] z1+y1/2
1400       ELSE
1410   x4=x1+(x2 x1)/2
1420   y4=y1+(y2 y1)/2
1430   z4=z1+(z2-z1)/2
1440   x5=x2+(x3 x2)/2
1450   y5=y2+(y3 y2)/2
1460   z5=z2+(z3 z2)/2
1470   x6=x1+(x3 x1)/2
1480   y6=y1+(y3-y1)/2
1490   z6=z1+(z3 z1)/2
1500   z4=z4+off(1 x4 y4 z4)
1510   z5=z5+off(1 x5 y5 z5)
1520   z6 z6+off(1 x6 y6 z6)
1530   Landscape 1 1,x1 y1 z1 x4 y4 z4 x6 y6 z6
1540   Landscape 1 1 x4 y4 z4 x2 y2 z2 x5 y5 z5
1550   Landscape 1-1 x4 y4 z4,x5 y5 z5 x6 y6 z6
1560   Landscape 1-1 x6 y6 z6 x5 y5 z5 x3 y3 z3
1570 END IF
1580 END DEFine Landscape
1590 DEFine Function off(1 x y z)
1600 LOCal offset
1610 RANDOMISE x+y+z/x y z+x/y+z
1620 offset=RND*1*10
1630 IF RND 5 THEN offset [illegible] offset
1640 RETurn offset
1650 END DEFine off
```

Amstrad character modes

Graham Redman

This machine code routine for the Amstrad CPC series allows characters of mode 0 size to be used on a mode 1 screen

The routine includes a demonstration showing how it can be used in your own programs

Enter *Poke 48597 163* to turn the routine on once installed and *Poke 48597 19* to switch the double height printing off

```
10 REM**LARGE WRITING IN MODE 1**
30 MODE 1:GOSUB 100
40 INK 0,0:INK 2 6:INK 3 19:PEN 2
50 LOCATE 4,2:POKE 48597,163:PRINT "ENLA
RGED WRITING":POKE 48597,19
70 PEN 1:LOCATE 2,5:PRINT" This is a mod
e 1 screen with a mode 0   size title in
 ink 3"
80 LOCATE 2,23:END
90 REM*****ENLARGED WRITING*****
100 MEMORY 41801
110 FOR n=0 TO 53
120 POKE 41802+n,VAL("&"+MID$("E5F5CD1AB
CF1EBCD45BB06074EC5D5060444AFCB213002F6CCC
B213002F633121310EFD1E5.1000819EBE123C11
0DEE12424242DC375BB" 2*n+1,2))
130 NEXT:RETURN
```

Collapsing Screen

Bryn Humphreys

This BBC listing shows how the 6845 CRTC chip can alter the amount of displayed characters on a Mode 1 or 2 screen. It does this by changing the value of register 1 in *Proc show_screen* and *Proc destroy_screen*

The listing gives a demonstration of the effects possible

```
10 MODE1:GCOL0,1
20 MOVE1280,0:PLOT85.640,800
30 COLOUR3:PRINTTAB(5,15)"The Amazing
Collapsing Screen"
40 COLOUR2:PRINTTAB(10,31);"* Press S
pace Bar *"
50 PROCshow_screen
60 REPEAT:UNTILGET=32
70 PROCdestroy_screen
80 END
90 DEFPROCshow_screen
100 FORX=1 TO 80
110 VDU23,0 1,X;0;0;0;:REM alter regis
ter 1 of 6845 chip
120 FOR WAIT=1TO30:NEXT
130 NEXT
140 ENDPROC
150 DEFPROCdestroy_screen
160 FORX=80 TO 0 STEP-1
170 VDU23,0,1,X;0;0;0;
180 FOR WAIT=1TO30:NEXT
190 NEXT
200 ENDPROC
```



With Kenn Garroch

Slipped disc

A F Wilson of Whitehaven in Cumbria writes

Q **Is it possible to convert a 500K Shugart compatible disc drive, with power supply, into a one megabyte drive If so, how easy would it be to fit a switch to transfer between 500K and 1000K modes?**

A There are a number of problems with what you propose The first is that you would need quadruple density discs to operate store your data Most discs are rated at single density (100K per side) or double density (200K per side) If you used double density discs and tried to put 400K per side you would have quite a few errors cropping up You can or could get quad density discs but these are phenomenally expensive

The other problem is inherent in the way disc drives work A stepper motor is used to move to the read/write head across the disc splitting the area into 40 or 80 tracks for single or double density A quad density system would need to have 160 tracks and so the stepper would have to have 160 steps The switchable 40/80 track drives are actually 80 track systems with a switch to cause the stepper to move two steps for each pulse instead of one step

For the system you propose you would need a quad density drive with a switch to do double steps giving 400K or 800K These are quite rare and unless the drive you have is one of these, you will not be able to make the stepper do half a step since the accuracy is not good enough

Your best bet is to buy a hard disc drive as these come in sizes of 5 10 20 and 40 megabytes

64 problems

Allan Gore of Winstanley, Wigan Lancs writes

Q **I have just bought a Hitachi 1444 moniter styled TV with RGB for use with my Commodore 54 Dixons, where I bought it, told me to go to any electrician to get the appropriate lead made up to give a crystal clear picture I have since been told by an electrical shop that the Commodore 54 is not compatible with RGB moniters**

I went back to Dixons and told them, but as far as they are concerned the monitor is compatible. Could you please tell me who is right? They will not refund the money if it isn't compatible How do I stand legally here?

Also I have a 1570 disc drive and bought a program called *Alternate Reality* which won't load. The 1541 and 1570 are supposed to be 100% compatible, although the Roms are slightly different, so it may be the protection on the disc. The shop I purchased it from says that they tested it on the 1541 and it loaded properly I have written to US Gold but have had no reply. Can I get my money back?

A The Commodore 64 is not RGB compatible however, the 128 is so maybe Dixons is a little mixed up Are you sure that the 1444 monitor does not have a composite video input? If it does the 64 will work and it's simply a matter of getting the right cable

If you are not satisfied with the monitor is it does not do what you purchased it to do, you are well within your rights to take it back and have your money refunded and the same applies to the game *Alternate Reality* The best thing to do with this is to phone US Gold and talk to someone about using their software with the 1570 The chances are that the protection is all that's stopping you playing the game and they should either advise you on how to get it working, or refund the money

Amstrad illumination

Jim Gibb of Wishaw, Strath clyde writes

Q **In response to Keith Platt's query about connecting a Ferguson TV/monitor to his Amstrad 464, I would like to point out that the RGB signals from the Amstrad CPC should be terminated in resistances of 1000 for the full colour range to be obtained**

The Amstrad monitor has these resistances, the Ferguson, and as far as I am aware other TV/monitors, have not. For this reason the RGB signals are non-standard

A box containing the required terminations could be constructed for connecting in-line with the cable

The luminance signal is not required since the RGB signals correctly combined contain the luminance information.

A The following diagram should do the trick The pin outs are the same as on page one of appendix V of the 464 user guide You will probably have to connect Sync as well (not shown in diagram)

100 Ω
100 Ω
100 Ω
Ground
Blue
Green
Red
To monitor
Silver 10%
Black
Brown

Want an ST?

K Sutch of St Helens Merseyside writes

Q **I am thinking of taking advantage of Silica Shop's offer and getting an Atari 520ST, without a monitor, for Christmas.**

Would it be worth buying an ST for programming purposes? I have used Spectrum Basic for the last two years and have just started to learn Z80 machine code I am also very interested in trying out new languages (eg, Logo). Another factor is, will the price of the ST fall dramatically within the next year or so or will it become obsolete with new advances in technology?

Could you use the ST with TV modulator in any resolution and if so, could you use something like *Neochrome* as it states 'colour systems only'?

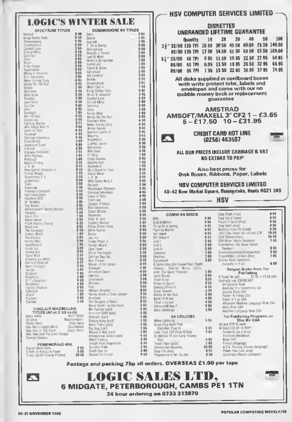
A The ST is quite good as far as programming goes since a lot of languages are available as conversions to 68000 If this is not enough Silica Shop is giving away a CP/M emulator If you can get the correct format discs there are even more languages available with this

The ST is unlikely to be obsolete within the next year although it is possible that the 104ST may become more of the in machine than the 520 since the price difference is not that great and you get all that extra memory

The main thing to bear in mind when looking to buy a computer is that you could wait forever for the price to drop Alternatively, it could fall next week

The 520STM (M for modulator) can be used in all colour modes (medium and lo-res) with a domestic TV However, the hi-res monochrome mode cannot be used However, nearly all ST software works in medium or low resolution

In reply to your question about *Neochrome*, yes it will work with a TV so will Gem Basic *Logo* and *1st Word*, etc


LOGIC'S WINTER SALE
SPECTRUM TITLES
COMMODORE 64 TITLES
SINCLAIR MACMILLAN TITLES (All at 2 99 each)
PERIPHERALS 48K
HSV COMPUTER SERVICES LIMITED
DISKETTES
UNBRANDED LIFETIME GUARANTEE
Quantity 10 20 30 40 50 100
3½" SS/DD 135 TPI 15 50 30 50 45 50 60 50 75 50 149 50
DS/DD 135 TPI 17 50 34 50 51 50 68 50 85 50 169 50
5¼" SS/DD 48 TPI 5 95 11 50 16 95 22 50 27 95 54 95
DS/DD 48 TPI 6 95 13 50 19 95 26 50 32 95 64 95
DS/DD 96 TPI 7 95 15 50 22 95 30 50 37 95 74 95
All disks supplied in cardboard boxes with write protect tabs, labels and envelopes and come with our no quibble money back or replacement guarantee
AMSTRAD
AMSOFT/MAXELL 3" CF2 1 – £3.65
5 – £17.50 10 – £31.95
CREDIT CARD HOT LINE
(0256) 463507
ALL OUR PRICES INCLUDE CARRIAGE & VAT
NO EXTRAS TO PAY!
Also best prices for
Disk Boxes, Ribbons, Paper, Labels
HSV COMPUTER SERVICES LIMITED
40-42 New Market Square, Basingstoke, Hants RG21 1HS
HSV
COMM 64 DISCS
64 UTILITIES
Bargain Books from 1st Publishing
1st Publishing Programs on Disc for C64
Postage and packing 75p all orders. OVERSEAS £1.00 per tape
LOGIC SALES LTD,
6 MIDGATE, PETERBOROUGH, CAMBS PE1 1TN
24 hour ordering on 0733 313870

Fair to Midi-ing

Mark Jenkins explains the basics of Midi and micro music for confused readers

We've discussed Midi more than once in this column before but the questions keep coming in from readers so this week, we'll look at Midi in some detail

Can you live without it, and can you plug it into your computer? Obviously there is a degree of confusion around – Paul Malley of Co Antrim has written in to say that he's keen to learn more about micro based music but the first time he heard Midi mentioned was on an episode of *EastEnders!*

So for Paul and anyone else who needs some basics on equipment and interfacing, here goes

Midi (Musical Instrument Digital Interface) is a standard which allows instruments including synthesisers digital pianos and other keyboards, drum machines sequencers, effects guitar synthesisers (such as the Stupp DG 1 and Synthaxe) and microcomputers to be connected together

If an instrument has Midi it will have one two or three five-pin Din sockets somewhere These are for the In Out and Through Midi functions If it doesn't have Midi, it's sometimes possible to add it with one of a range of Midi convertors and accessories now available

Midi is a serial digital interface like RS432 – it transmits on and off voltages which add up to a binary language which is interpreted by a microprocessor in the receiving instrument This language (the dictionary for which a document called *The Complete SCI Midi Version 1 0* is published by Sequential Circuits) contains many different words and has several different functions The main function is to simulate the playing of notes on a keyboard Midi has 128 values for different notes which cover 11½ octaves much more than a normal piano keyboard Send a note on code plus one of these values to a synthesiser over Midi and that note will sound

What's the point of Midi control? Well like all computer systems there are several possible applications The simplest is to connect two keyboards together (from the Midi Out socket of one to the Midi In socket of another) so that they both play the same notes simultaneously, thickening the overall sound Another application is to control many synthesisers from a micro which has recorded some Midi data (from a keyboard or guitar controller input) so you can play back a complete composition and edit it

Midi can do this because it operates on 16 different channels which can be selectively used by each instrument playing back Midi also contains a code for a clock pulse so you can connect sequencers and drum machines by Midi and they'll all run at the same speed There are also codes for the following

Key Velocity – so that sounds are louder if you hit the keys harder

Key Pressure – to introduce vibrato and other effects if you push down on the keys

Pitch Bend – controlled from a special pitch bend wheel or lever



Not a guitar, but the Synthaxe Midi controller

Modulation – for vibrato effects from a wheel or slider

Patch Change – to switch to a new sound

A Midi sequencer or Midi-equipped micro with appropriate software will record all these pieces of data and allow you to edit them individually – so if you give a performance of a piece but don't like the pitch bend on the fifth note of the sixteenth bar, you can edit it out

It's possible to add Midi to the Commodore 64 (with an interface from Sequential Jellinghaus Siel C-Lab Steinberg or many more) to the BBC (with an interface from UMI EMR and others) and to MSX, Amstrad and other micros The Atari 520/1040 ST micros have Midi sockets as standard while the Spectrum Plus also has Midi sockets of a sort (BT phone plugs were used in a devastating example of false economy)

Midi is almost compulsory now on all but the cheapest new keyboards and if you have older equipment working on analog voltages you can buy an analog-to Midi or Midi-to-analog converter (don't expect miracles, though – even some Midi equipment has limitations for example in whether it can give out or respond to velocity or pressure information whether it can play more than one sound at a time over Midi, and so on)

Midi equipment is expensive compared to budget micros although it's becoming cheaper – Casio's excellent CZ 101 Midi synth is about £248 Roland has a Midi sound module without a keyboard for around £150, and some Midi software is not too expensive (professional software starts at around £100 though) But do you absolutely need to have Midi to make music? The answer is "No" – you can produce very impressive music with your micro's built in sound chip (particularly on the Commodore 64), you can add very authentic drum sounds with a Datel or Tron unit and keyboards and FM synthesiser modules to your heart's content

But the fact of the matter is that the world of semi pro and professional music has taken Midi to its bosom, and is determined to make it a living, expanding system which offers some wonderful options even for those without much money to spend Midi does have some secrets and some problems but no more so than the average micro-computer It's worth spending some time, effort and money to come to terms with such a powerful music-making system Your local music shop will be happy to help you – particularly if you make them think that you're about to spend some money

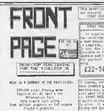
If you have any queries or tips for this column please write to Mark Jenkins at Popular Computing Weekly, 12–13 Little Newport Street London WC2H 7PP Mark would also welcome examples of your own music on audio or program tape, or disc

CLASSIFIED

Semi-display — £7 per single cc (+ VAT)
Lineage — 30p per word (+ VAT)

CALL RODNEY WOODLEY on *01-437 4343* FOR SEMI/DISPLAY ADVERTISING

SOFTWARE



Yes, the QL can now do desktop publishing, and can do it economically!

FRONT PAGE allows you to do something USEFUL with your QL. Design your own artwork, produce your Company newsletter, make up leaflets quickly.

AND DO IT ECONOMICALLY!

FRONT PAGE is:

FULLY MENU DRIVEN

SELF-CONTAINED

VERY EASY TO USE

AND ECONOMICAL

REMEMBER WHERE YOU READ IT FIRST-ON FRONT PAGE!

GAP SOFTWARE, 17 ST. JOHN'S TCE, LONDON, E7 8RX: 01-552-5452

P&P INCLUDED FOR UK AND EUROPE. ADD £1-00 FOR OUTSIDE EUROPE

QL 4MATTER SUITE V5.3

Corrupted master? What are they?

Byte for byte only duplicator ... software for as little as ... inc. ...

... invisible files, dates and file ...

... EPROMs from ... + ... window editor ...

£9.95 to Steve Jones

ZITASOFT

93 Foxbourne Road, London SW17 8EN

P.S. Advise update price v5.3

STOP PLAYING GAMES

Use your computer to make money. Turn your hobby into a home-based income. Full and part time opportunities to cash in on this tremendous market. High earnings easily possible. Open to any amateur micro user and gamer. Write for free details.

Westlink Promotions (CW1)
48 Great King Street
Edinburgh EH3 6QY

LOOK

400/800 XL/XE NOW ST

ATARI OWNERS

Are you having difficulty finding suitable software? If so, then look no further. We have available for both hire and purchase one of the largest selections of both UK and American titles to choose from. Games and Utilities for all ages. Hardware and add-on utilities at discount prices and special deals regularly being offered. If you would like further information please send a large s.a.e. to:

BLANK DISCS 5¼in.

ALL discs have reinforced hubs, are certified error free and guaranteed for life. **MIMIC FLIP SIDED** discs are manufactured for double sided use on any single sided drive such as the Atari, Commodore, Cumana etc drives. Tracker discs can be supplied with B side notch if requested.

DS/DD 96tpi	10	25	50	100	10 in plastic library case
UNBRANDED	N/A	£14.95	£27.95	£49.95	N/A
TRACKER	£7.95	£17.95	£33.95	£89.95	£8.95
MIMIC	£9.95	£22.95	£43.00	£95.00	£10.95

ALL above discs come with **WRITE PROTECTS, LABELS** and **SLEEVES**

LOCKING DISC BOX — holds 100 **£11.95** or just add **£10.00** when purchased with 50 or 100 of the above discs

ATARI 8-BIT DISC SOFTWARE

DOS 4.0 The best DOS yet. Works in single, enhanced and double density plus many other advantages over the other DOS's. **£4.95**

SHEER FORTH Powerful FIG-FORTH language disc, double sided with tutorial on B side. **£9.95**

FIX XL — Translator with extra 4K of RAM in machine code. **£3.95**

DOUBLE DENSITY MOD from **£19.95** to **£29.95** (depending on software)

SLABS 3½in. DISCS!!!

135tpi	10	25	50	100	10 in plastic case
SS/DD	£14.95	£34.95	£64.95	£124.95	£16.95
DS/DD	£17.95	£36.95	£74.95	£144.95	£18.95

MITSUBISHI
MF 2DD £23.95 BOX (10) — 2 BOXES ONLY £44.95
LOCKING DISC BOX — holds 80 — **£14.95** or just add **£12.00** when purchased with 50 or 100 of the above discs

ATARI 16-BIT SOFTWARE

BOTH DISCS HAVE OVER 100K OF PROGRAMS ON THEM.

DESK ACCESSORY 1 — Includes a directory printer, a printer spooler and a digital watch. **£7.95**

DESK ACCESSORY 2 Includes a variety of ram discs, an analog clock and a calculator which works in hex and dec with direct conversion. **£7.95**

Many other ATARI 8 and 16 BIT programs — just write for more info.
Cheques etc. payable to **STORT SOFT** (International orders add 10% and remit in Pounds/Sterling by Bank Draft or Intl. Giro)

Send to

STORT SOFT (Dept PC3)
18 Crown Close, Sheering, Bishop's Stortford, Herts CM22 7NX

★ QL SOFTWARE ★

★ CHARACTER TOOLKIT £12 ★

This package contains all you need to create and use your own character sets on your QL. It also contains routines that allow you to print characters of an infinitely variable size anywhere on the screen. To help you design your character sets we have even included a special designer program which makes it even easier.

★ ICON TOOLKIT £12 ★

This package contains all you need to turn your QL into an icon controlled super micro — takes the tedium out of typing, unlike some systems, ours is fully programmable. You can program the icons to do anything you like — you can of course redesign the icons themselves and we have even included a special designer program to make the ends that bit easier.

This toolkit also contains lots of new graphics commands, all of which have the ability to draw using user defined patterns, not just solid lines. There is even a new fill command that will fill any shape with any user defined pattern (features like these are normally only to be found in the most expensive of drawing programs). We even throw in a special pattern designer so that you can design your own new patterns at leisure.

There are also 2 Epson compatible screen dumps, a print spooler and an on screen notepad.

★ GAME TOOLKIT £12 ★

This toolkit contains everything you need to create fast animated arcade games on your QL. It also contains extra routines to allow you to produce multi-tasking tunes (like the ones found in all the best arcade games). You can have up to 32 sprites all of which can have up to 10 frames of animation. Collision detection is also provided and of course it goes without saying that our sprites are some of the fastest and smoothest around. A sprite designer is also included.

★ COMPLETE TOOLKIT £30 ★

All three toolkits on one cartridge offering a substantial saving — probably the best toolkit ever!!!

★ SOUND EXPERIMENTER £12 ★

This is probably one of the most original and interesting packages ever written for the QL. Using this package you can turn your QL into a sort of primitive digital synthesiser. The package actually allows you to draw sounds on your QL screen and then play them back either forwards or backwards, in whole or in part. If you are at all interested in sound synthesis or you just like making silly noises then this is the package for you, and there is also a special program included to help you get better acquainted with the super basic beep command (saves hours of messing about trying to find the sound you want).

★ BLORZ £5 ★

THE RUBBERISED ASTEROIDS GAME — ADDICTIVE ARCADE ACTION

Send cheques or P O s to

SMILING SOFTWARE
10 Fu Road, Marple, Stockport SK6 6HA

COMPUTER SWAP

Computer Swap entries are limited to 30 words. All entries cost £2.50. Please enclose a cheque or postal order or give Access or Barclaycard No. in the box provided. Only text appearing in the grid will be printed. Send the form to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP

PLEASE NOTE All software offered through computer swap must be in original condition and for private sale only. No advertisements for lists of software will be accepted.

It cannot be swapped
Warning It is illegal to advertise pirated software

COMPUTER SWAP

Please write your copy in capital letters on the lines below

Name ....

Address ....

.... Telephone ....

☐ *Please charge my Visa/Access card no* | | | | | | | | | | | | | | | | |

ASIRUS SETTLER

THE FIRST COMPLETE RACING PROGRAM

ASIRUS SOFTWARE now offers a complete RACING PACKAGE containing everything you will ever need in your pursuit of backing WINNERS But like all things to do a good job you need good tools and we have the best

● **HORSE FORMULATOR** Use for NATIONAL HUNT and FLAT HANDICAP and NON-HANDICAP races Based on a METHOD known to be CONSISTENT Just type in the DATA from any DAILY or RACING PAPER and the computer will select the HORSE with the BEST chance of WINNING together with its RATING

● **GREYHOUND FORMULATOR** Use for any TRACK, OPEN and GRADED RACES Just type in DATA asked for and the COMPUTER will give RATINGS for all dogs together with its best SELECTION

● **SETTLER** This powerful SETTLER will SETTLE SINGLE and MULTIPLE bets to any STAKE and S/P No need to work out your bets on paper

● **PERMULATOR** To perm bets which have more than one SELECTION in a race useful for working out DOUBLES TREBLES 4 FOLDS and MULTIPLE PERMING

● **WINNING PERCENTAGE** For the HORSE and GREYHOUND FORMULATORS This depends upon the ACCURACY of the DATA fed in but the approximate percentage runs between 60 and 75 per cent

To complete the package all INSTRUCTIONS can be called onto SCREEN while the program is running To obtain a copy of THE ASIRUS SETTLER fill in the form below and together with a remittance of £20 send to

ASIRUS SOFTWARE,
54 Doverhouse Road
Putney London SW15 5AU
Tel 01 878 2641

POs/cheques payable to ASIRUS SOFTWARE price includes POST and PACKAGE

THE ASIRUS SETTLER is available for ALL SPECTRUMS and ALL AMSTRADS CPC s only (all programs supplied on cassette)

I enclose cheque/P O for £

NAME

ADDRESS

Postcode

COMPUTER

pcw

POOLSMASTER

GUARANTEED WINS ● GUARANTEED WINS ● GUARANTEED WINS

ASIRUS SOFTWARE presents the most up to date method for winning the POOLS ever devised So much so that the company has decided to LIMIT the number of copies available to 3,000 which means it is FIRST COME FIRST SERVED Whatever method you have used in the past whether it be FORM MAGIC NUMBERS or UP DATING OF DATA you can now forget WHY because POOLSMASTER eliminates all CHANCE giving you a method which can be used ALL YEAR ROUND with consistent returns of DIVIDENDS

Developed over the past 2 years accuracy was our aim in finding a WINNING method we did it and called it POOLSMASTER Coupled with easy to follow on screen instructions which enables the user to see how POOLSMASTER operates and why it works and also showing how to STAKE and PERM your coupons to give MAXIMUM returns making it a complete package

To obtain a copy of POOLSMASTER and remember there are only 3,000 copies available fill in the form below and together with a remittance of £30 send to

ASIRUS SOFTWARE
54 Doverhouse Road Putney
London SW15 5AU

POs/cheques payable to ASIRUS SOFTWARE price includes POST and PACKAGE

GUARANTEE

ASIRUS SOFTWARE guarantee that POOLSMASTER will give you a winning dividend/dividends within 12 weeks or less Should POOLSMASTER not perform as stated show then return the program for a £30 refund

POOLSMASTER is available for ALL SPECTRUMS ALL AMSTRAD CPCs and COMMODORE 64/128 (all programs supplied on cassette)

I enclose cheque/P O for £

NAME

ADDRESS

LIMITED EDITION

Postcode

Computer

PLEASE ALLOW UP TO 28 DAYS FOR DELIVERY

POOLSMASTER © 1986

AMSTRAD CPC464 colour monitor disc drive portal Kempston joy stick much original software magazines folding desk £400 o n o Tel Workington 64493

C64/C128 OWNERS For a listing of any basic program (cassette or disc) send £1 50 to Mr S H Smith 57 Upper Kingston Lane Shoreham Sussex BN4 6TG

PREVENT Yob spikes from vandal ising programmes with the Stopguard Mains Transient Suppressor Plug £12 75 Richardson Electronics 5 Penrith Road Maghull Lancs L31 9BN

BIG MONEY with your micro! Your own part-time full time business Brand new easy to follow book shows you how! For free details send S A E to Golden Pages Publications 31 Steade Road Sheffield S7 1DS

CLASSIFIED ADVERTISING RATES:

Line by line 30p per word, minimum 20 words

Semi-display £7 per single column centimetre minimum length 2 cm (Please supply A/W as PMT Or supply rough setting instructions)

THESE RATES DO NOT INCLUDE VAT

Conditions All copy for Classified section must be pre paid Copy date 7 days before publication

IF YOU WISH TO DISCUSS YOUR AD PLEASE RING Rodney Woodley 01-437 4343

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)



		Please continue on a separate sheet of paper	

I make this words at per word so I owe you £

Name

Address

Telephone

Please cut out and send this form to Classified Department *Popular Computing Weekly* 12 13 Little Newport Street London WC2H 7PP



FOR SALE

FAULTY SPECTRUM?

As you are probably aware from press reports Sinclair Computers no longer have a repair department.

Our computer repair workshop has been an OFFICIAL Sinclair Repair Depot for the past six years and we are pleased to announce that we will continue to do your out of guarantee repairs as in the past

Send your faulty computer DIRECT

SPECTRUM	£19.73 inc parts
ZX81	£11.95 inc parts
16K RAM	£9.95 inc parts
MICRODRIVE	£19.95 inc parts
INTERFACE 1-11	£18.75 inc parts

CALL OR SEND WITH CHEQUE OR P.O

T V SERVICES OF CAMBRIDGE LTD
FRENCH'S ROAD, CAMBRIDGE CB4 3HF
Tel: 0223 311371

NEW AND USED COMPUTERS INCREDIBLE DISCOUNTS!!

ATARI CONSOLE £39.95 C64 PACK £183

SPECTRUMS £PHONE BBC AMSTRAD

IBM COMPATIBLES

BROTHER PRINTER £118

DISC DRIVES FROM £58

THE COMPUTER DEPOT
205 BUCHANAN STREET, GLASGOW G1 2JZ
041 332 3044

SPECTRUM REPAIRS – XMAS SPECIAL

(From 1st November – 31st December)

DON'T LET HIGH COST REPAIRS SPOIL YOUR CHILD'S XMAS

for fixed cost, fast, reliable SPECTRUM repairs done by experts.

MICRO-SERV are SCOTLAND'S No 1 for COMPUTER repairs

For the following same day Services

★ Spectrum/Spectrum Plus repairs	£18.95
★ Membrane repairs (Spect and Spect Plus)	£11.00
★ ZX PSU's (sent separately)	£6.00
★ Spectrum to Spectrum Plus Upgrades (fitted free)	£28.50
★ 16K to 48K Memory Upgrades (fitted free)	£19.95

(Prices quoted include Parts, Service, V.A.T. and Post & Packing)

WE CAN ALSO REPAIR DISC DRIVES PRINTERS MONITORS CASSETTE UNITS C16/64/PLUS 4 QL I/F's MICRO DRIVES ETC

Call or send Spectrum to
MICRO-SERV (Scotland) LTD
95 DEERDYKES VIEW
WESTFIELD INDUSTRIAL AREA
CUMBERNAULD G68 9HN
Tel 0236 737110

ACORN APPROVED SERVICE CENTRE FOR REPAIRS TO BBC ELECTRON
★ ★ ★
TRADE SCHOOLS COMPUTER CLUBS QUERIES WELCOME

SPECIAL OFFERS!

Computers & unwanted computer stock wanted for cash
Now open! Computer Repair Dept
Faster & cheaper than the average (90 day warranty)

THERSBY COMPUTERS
26–28 Bowesfield Lane, Stockton, Cleveland TS18 3ER Tel: (0642) 604768

FOR SALE

LOW PRICES–HIGH QUALITY

5.25" BRITISH MADE FLOPPY DISKS

Quantity Ordered (price per disk)

	Track	10–99	100–249	250+
SS/SD	40	£0 59	£0 54	£0 50
SS/DD	80	£0 69	£0 60	£0 55
DS/DD	40	£0 82	£0 73	£0 69
DS/QD	80	£0 88	£0 82	£0 75

INTRODUCTORY OFFER
For every ten ordered we will send you twelve!

These prices include hub rings envelopes labels and write protect notch tabs

To ensure the high quality of these disks every track and sector has been tested and is certified equal to or in excess of every Disk Standard

3.5" DISKS–packed in tens with FREE Plastic Library Case.

SS	135 tpi	£9 50	£18 00	£16 00
DS	135 tpi	£25 00	£23 00	£21 00

Free delivery – All orders despatched within 24 hrs
Add VAT at 15%

Our **Quality Guarantee:**
Lifetime Warranty – two for one or money back if not satisfied

How to order Cheque/Postal Order with order to

Longworth Ltd
31 Bridge Street, Newport, Gwent NP9 4BH
Tel: (0633) 52538 24 hour answering service

SOFTWARE – 1000's IN STOCK!!!

AMSTRAD – ATARI – BBC – C64 – C16/+4
CBS – DRAGON — ELECTRON — MSX — ORIC
SPECTRUM — TEXAS — VIC 20
GAMES + UTILITIES

CASSETTES — DISCS — ROMS

ALL YEAR-ROUND SALE PRICES

THE COMPUTER DEPOT
205 BUCHANAN STREET, GLASGOW G1 2JZ
041-332 3944

GALLERY SOFTWARE

1st FLOOR,
THE ARNDALE CENTRE
WANDSWORTH,
LONDON SW18
TEL: 01-870 4941

(164)



AMSTRAD DISCOUNT

PCW8512	£450
PCW8256	£350
6128 Colour	£330
6128 Green	£230
1012SLQ	POA
DMP2000	£128

VAT 15% D/LVY £5
M/FCTRS G/RNTEE
JAMES MAIL ORDER
PO BOX 299 LONDON E6 3JH
Tel 01 923 2170 (160)

HOME ACCOUNTS

Put your house in order. Probably the best home use for your computer! Comprehensive coverage of home accounts, credit cards, HP, standing orders etc. Inbuilt security check for all transactions. Cashflow projection. For all Amstrads, Commodores, AMS Spectrums.
£9 95 or FREE details from

DISCUS,
FREEPOST
ILFORD IG1 1BR
Tel 01 514 4141
(24 hours live!) (118)

BETA SPECTRUM disc interface with utility discs £50 Commodore 3040 dual disc drive £100 Needs attention Romford (0708) 46948

FOR SALE

QL, BROTHER M1009 PRINTER Tandata modem joystick 24 cartridges in storage box some games books mags £300 Will separate Tel Tadcaster (0937) 834276

VERSION 2·3 QUILL Abacus Archive Easel engine! Psion software still in case £10 for the set of 4 Tel Worthing 206443

DUPLICATION

The Knightsbridge Stables
Tel 0869 25 3021 (73)

CASSETTE COPIES

50 C10s FOR ONLY £40 INC P + P
FROM YOUR CASSETTE MASTER
IN REAL TIME PLEASE PACK
IN FOIL AND SEND CHEQUE TO—

SOUNDS GOOD
CLEAR CROFT, BOTTOM LANE,
SEER GREEN, BUCKS HP9 2UH
TEL. (04946) 5800

A & R COMPUTER SERVICES
★ **LOOK!** ★
UNBEATABLE PRICES

Send S A E for a complete catalogue stating which machine to

A & R COMPUTER SERVICES
80 Sandfields Crescent, Leigh Park
Havant Hampshire PO9 5ER (76)

EPSON FX80 PRINTER plus 32K Buffer £275 Amstrad FD-1 2nd disc drive with interface cable £85 Tel 01 302 9984

AMSTRAD CP/M SOFTWARE send a blank formatted disc plus £5 to Hudson Computer Services 5 Swanborough Place Brighton BN2 5PZ

ATARI ST software at the keenest prices i e Mercenary £19 95 Send S A E for a pricelist Live Wire 1 City Bank Road Cirencester Glos

PUZZLES If you like puzzles you should read Puzzle Solving for the BBC Computer Send £5 (inclusive postage) to P G Amey 31 Hillmont Road Hinchley Wood Esher KT10 9BA

ATARI 520 STM, half meg disc drive high-res monitor Citizen 120D printer leads software books three months old boxed as new £699 Tel Derek on 01 806 4180 after 7pm


There's a Dealer near you . . .
ESSEX
ESTUARY
PERSONAL COMPUTERS
318 CHARTWELL NORTH
VICTORIA CIRCUS SHOPPING CENTRE
SOUTHEND ON SEA
Tel: (0702) 614131
NOBLES
14-17 EASTERN
ESPLANADE
SOUTHEND-ON-SEA,
ESSEX
Tel: (0702) 63377/8
GLASGOW
THE COMPUTER DEPOT
205 BUCHANAN STREET
GLASGOW G1 2JZ
Tel (041) 332 3944
MEGABYTE
12 ETTRICK SQUARE
CUMBERNAULD
G7 1NQ
0236 738398
SCOTLAND
FOR BARGAIN DISCS
CALL
GRABACOIN
9 LOW ROAD,
CASTLEHEAD,
PAISLEY,
SCOTLAND
PA2 6AQ
Tel 041-889 0885
LEEDS
MICROPOWER
NORTHWOOD HOUSE
NORTH STREET
LEEDS LS7 2AA
Tel (0532) 458800
LONDON
GALLERY SOFTWARE
1st FLOOR
THE ARNDALE CENT,
WANDSWORTH,
LONDON SW18
Tel: 01-870 4941
LIVERPOOL
NABITCHI COMPUTING
SPECIALISTS IN AMSTRAD
PCW8256 – PCW8512
SOFTWARE & HARDWARE
131 MOUNT PLEASANT
LIVERPOOL L3 5TF
051 709 0123/708 8775
Software Design Service Available
Microbyte
We talk business not bits & bytes
NO 1 ON MERSEYSIDE FOR
ATARI AND AMSTRAD
71 SEAVIEW ROAD WALLASEY,
MERSEYSIDE L45 4QW
(051) 630 6933/638 1420
10 am – 6 pm
MAIL ORDER
SERVICE AVAILABLE
OXFORDSHIRE
WITNEY
COMPUTER CENTRE
105 HIGH STREET,
WITNEY,
OXFORDSHIRE
Tel 0993 78294
YORKSHIRE
YORK COMPUTER CENTRE
7 STONEGATE ARCADE
YORK
Tel (0904) 641862
SURREY
ULTIMA
UNIT 28
WHITE LION WALK
GUILDFORD
(0483) 506939
AMSTRAD SOFTWARE, Cyrus II chess £10 Prospell £14 Hitchhiker's Guide £15 Sanyo MBC 550 twin disc PC + Wordstar Calcstar Datastar Reportstar manuals Sanyo Basic el most new £240 o.n.o. Tel Neum (0602) 636247
SPECTRUM 48K DK Tronics keyboard sound amplifier interface one including two micro drives ten cartridges trans express and m/drive doctor Only £125 Can split Also unused rubber type keyboard £10 Tel Coventry 617571
TATUNG EINSTEIN COMPUTER plus colour monitor plus printer and joystick plus software £270 Cumana double disc drive self powered suitable BBC or Einstein £120 Tel Kingswinford 279987
ATARI 1029 PRINTER (no interface required) £60 Atari 810 disc drive with archiver chip (backs up 95% of software) £55 Antic Analogue computer magazine £1.25 also books discs for sale Tel 01 293 0676
COMPSWAP
SPECTRUM 128 interface one microdrive software all boxed new Swap for QL colour monitor or disc drives for Epson printer or £140 cash Tel Bren 0707 58515
DK TRONICS ROM based lightpen unwanted gift for Amstrad CPC £30 new will accept £20 Tel 0734 898544
CPC6128 colour/mono monitors £275 second drive £80 mouse £45 Utopia Rom £20 CPC464 64K Ram pack £30 Firmware guides books software half list price Tel 0482 899005 evenings
MEMOTECH MTX512 96K Ram wordprocessor Roms or Pascal Roms (if both £20 extra) recorder facilities games two manuals service sheets books Bargain £75 Demos 061-865 6903 anytime
APPLE EUROPLUS two disc drives Amber vdu graphics tablet Trackball thermal printer joystick colour speech cards business and games software Cost £2500 accept £800 Tel 0683 53284
SPECTRUM 48K with software plus joystick for only £35 VTX modem £15 or both for £40 Tel Syresham 384 ask for Stephen
SINCLAIR QL plus CST 512K expansion Also Ferguson monitor Psion package (v2 3) Touchtype and a CAD program Come and see it running only £195 Tel 0580 211 236 (Kent)
COMMODORE CBM 8096 with disc drive 8050 Ant printer 8023P in perfect working order Complete business system for £650 o.n.o. Tel 0606 848539
VDU OPERATORS DO IT WITH A
THINGI
computer copy holder
BUSINESS
IDEA OF THE YEAR
OUTRIGHT WINNER
Makes an Ideal Christmas Gift – Everybody needs a Thingi!
Unique Velcro Fastening
Left hand or right hand versions
What colour clip do you want?
The affordable copy holder that suits your needs
GRAB YOUR THING! NOW
£6.99

New Releases

John Cook looks through this week's new arrivals

Amstrad CPC

Program *Kwah* **Type** Graphic Adventure **Price** £8 95 **Micro** Amstrad CPC **Supplier** Melbourne House 60 High Street Hampton Wick Kingston upon Thames Surrey KT1 4DB

Program *Booty* **Type** Arcade **Price** £1 99 **Micro** Amstrad CPC **Supplier** Firebird 74 New Oxford Street London WC1

Two years after the Spectrum version comes the Amstrad. Already sold a reputed 160 000 on other formats now s your chance to give those Telecom shares a boost

Program *Cylu* **Type** Arcade Adventure **Price** £1 99 **Micro** Amstrad CPC **Supplier** Firebird 74 New Oxford Street London WC1

Program *Future Knight* **Type** Arcade Adventure **Price** £9 95 (tape) £14 95 (disc) **Micro** Amstrad CPC **Supplier** Gremlin Graphics Alpha House 10 Carver Street Sheffield S1 4FS

Program *Nosferatu the Vampire* **Type** Arcade Adventure **Price** £9 95 **Micro** Amstrad CPC **Supplier** Piranha, 4 Little Essex Street London WC2R 3LF

Looks lovely on the telly, plays well – superior arcade adventuring via the talented Design Design team

Program *Werner* **Type** Weird Arcade **Price** £8 95 (tape) £14 95 (disc) **Micro** Amstrad CPC **Supplier** Ariolasoft 68 Long Acre London WC2E 9JH

The weird and wonderful adventures of a German biker If this program wasn t written on an extended acid trip then the instruction manual certainly was

Atari

Program *War Hawk* **Type** Arcade **Price** £1 99 **Micro** Atari XL/XE **Supplier** Firebird. 74 New Oxford Street London WC1

Atari version of a Commodore 64 vertical scroll shoot em-up heavily inspired by Sege s *Astro Warrior* has strong influence on Andrew Braybrook s *Uridium*

Turn brain off turn auto-fire on If there is a programming equivalent of the Big Mac then this is it

Program *Masterchess* **Type** Strategy **Price** £1 99 **Micro** Atari XL/XE **Supplier** Mastertronic 8–10 Paul Street London EC2

Program *Molecule Man* **Type** Arcade Adventure **Price** £1 99 **Micro** Atari XL/XE **Supplier** Mastertronic 8–10 Paul Street London EC2

3-D Knight Lore type game with a difference – you can redesign the whole thing to suit yourself can t be bad

BBC and Electron

Program *Ravenskull* **Type** Arcade Adventure **Price** £9 95 (tape), £11 95 (disc) **Micro** BBC B/Master/Electron **Supplier** Superior Software Dept RS1 Regent House, Skinner Lane Leeds LS7 1AX

Ravenskull is a plan view four-way scrolling arcade adventure from the increasingly prolific Superior stable Written in *Mode 5* it consists of four levels each comprising 64 screens worth of castle And that s quite a lot

Superior describe this as, a hybrid of *Repton* and *Citadel* and it would be difficult to disagree Funny they didn t call it Reptadel really isn t it?

Program *Ravenskull* **Type** Arcade Adventure **Price** £9 95 (tape) **Micro** Electron **Supplier** Superior Software Dept RS1 Regent House Skinner Lane Leeds LS7 1AX

Program *Dodgy Geezers* **Type** Adventure **Price** £8 95 **Micro** BBC B/Electron **Supplier** Melbourne House 60 High Street Hampton Wick Kingston upon Thames, Surrey

Lever and Jones again – this time in Minder land leaving it out and knocking it on the head al most ad nauseam It does make a change from pixies but very soon after starting *Dodgy Geezers* I began to find the humor predictable, forced repetitive and the short location descriptions completely uninspiring Maybe other versions are better but this BBC/Electron version was well out of order

Pick of the week

Lost for words

Program *Scrabble* **Type** Strategy **Price** £19 95 **Micro** Amstrad PCW 8256/8512 **Supplier** Virgin Games 2–4 Vernon Yard Portobello Road, London W11 2DX

Ou Ee Ey Sounds like just another chapter in the life of everyday country folk doesn t it? But no they re just a few of the words that the computer will hit you with on level eight of Leisure Genius s *Scrabble* on the PCW

If you think about it the only surprise is that it took this long for them to convert the most famous word game into the most famous word processor And to my mind it s the best version yet It s got a vocabulary of almost 22 000 words specially selected from Chambers Words (the reference guide for all crossword and Scrabble freaks) and the Chambers 20th Century Dictionary (as used in official Scrabble tournaments) That s about 10 000 more than in the previous home micro versions It also seems to be slightly faster The graphic display of the board and the tiles although only in glorious green is very well designed and looks a treat

Two to four players may take part – any or all of them being computer opponents which can take any one of eight levels Level One is pitched at around my standard (semi-literate 200 points in a two player game) whereas Level Eight caters for the awesome mega-being that has no problem accumulating 400 plus The real watershed occurs at Level Five when an extended vocabulary of obscure words comes into play When did you last go gorming for instance?

The beauty of computer *Scrabble*, however is that when you put down a word that the computer does not recognise – and even given its relatively large vocabulary, this happens more often than you would think – it simply challenges you thus Are you sure? it politely asks Too right matey – and next time you go dibbling behind the bike sheds remember where you read it first

Commodore 64

Program *Computer Word search* **Type** Utility **Price** £6 95 **Micro** Commodore 64 **Supplier** Softfirm 21 Ashbourne Way Thatcham Berks RG13 4SJ

Program *Quest of the Golden Orange Peel* **Type** Adventure **Price** £3 99 **Micro** Commodore 64 **Supplier** Dual Dimension Software Cederwood Dankes Lane Potters Bar Hertfordshire EN6 1DA

Program *Mad Nurse* **Type** Warped Arcade **Price** £1 99 **Micro** Commodore 64 **Supplier** Firebird 74 New Oxford Street London WC1

Program *GoGo the Ghost* **Type** Arcade **Price** £1 99 **Micro** Commodore 64 **Supplier** Firebird. 74 New Oxford Street London WC1

Program *Future Knight* **Type** Arcade Adventure **Price** £9 95 (tape), £14 95 (disc) **Micro** Commodore 64 **Supplier** Gremlin Graphics Alpha House 10 Carver Street, Sheffield S1 4FS

Program *Masterchess* **Type** Strategy **Price** £1 99 **Micro** Commodore 64 **Supplier** Mastertronic 8–10 Paul Street London EC2

Program *Molecule Man* **Type** Arcade Adventure **Price** £1 99 **Micro** Commodore 64 **Supplier** Mastertronic 8–10 Paul Street London EC2

Commodore 16

Program *Masterchess* **Type** Strategy **Price** £1 99 **Micro** C16/Plus 4 **Supplier** Mastertronic, 8–10 Paul Street, London EC2

Program *Molecule Men* **Type** Arcade Adventure **Price** £1 99 **Micro** C16/Plus 4 **Supplier** Mastertronic, 8–10 Paul Street, London EC2

Program *Cops n Robbers* **Type** Arcade **Price** £2 99 **Micro** C16/Plus 4 **Supplier** Atlantis Software, 28 Station Road London SE25 5AG

Program *League Challenge* **Type** Strategy **Price** £2 99 **Micro** C16/Plus 4 **Supplier** Atlantis Software, 28 Station Road London SE25 5AG

Program *Xcellor 8* **Type** Arcade **Price** £6 95 **Micro** C16/Plus 4 **Supplier** Gremlin Graphics, Alpha House 10 Carver Street Sheffield S1 4FS

Program *Future Knight* **Type** Arcade Adventure **Price** £6 95 **Micro** C16/Plus 4 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS

MSX

Program *Future Knight* **Type** Arcade Adventure **Price** £7 95 **Micro** MSX **Supplier** Gremlin Graphics Alpha House, 10 Carver Street Sheffield S1 4FS

QL

Program *Liberator* **Type** Utility **Price** £69 95 **Micro** Sinclair QL **Supplier** Liberation Software 43 Clifton Road, Kingston upon Thames KT2 6PJ

The Definitive SuperBasic Compiler they call it Well we ll be finding that out in a full review quite soon but first impressions show this to be a professionally put together package that is going to be of interest to a lot of QL owners

Program *Viewpoint* **Type** Utility **Price** £19 95 **Micro** Sinclair QL **Supplier** Rubicon Computer Systems 11 Bannerdale Road, Sheffield S7 2DJ

Construct your own wire frame 3-D graphics with this package – then zoom in and out view the system from another coordinate print it out etc

In fact with a bit of practice you could probably convince your friends that you had *Elite* running on your QL

Spectrum

Program *The Colour of Magic* **Type** Adventure **Price** £9 95 **Micro** Spectrum **Supplier** Piranha 4 Little Essex Street London WC2R 3LF

Multi-load graphic adventure (four parts to be precise) hewn from Terry Pratchett s wacky tome by those equally zany types from Delta 4 It drew a mixed reaction from the *Popular* games testing droids ranging from the bored to the enthusiastic

Don t expect state-of-the-art in sophisticated sentence analysis but the humor of the excellent novel comes across well enough

Program *Dome Trooper* **Type** Graphic Adventure **Price** £2 95 **Micro** Spectrum **Supplier** Matand Software 29 Moorland Road Mickleover Derby DE3 5FX

Program *Tir Francias* **Type** Educational **Price** £2 95 **Micro** Spectrum **Supplier** Matand Software 29 Moorland Road Mickleover Derby DE3 5FX

Program *Kwah* **Type** Graphic Adventure **Price** £7 95 **Micro** Spectrum **Supplier** Melbourne House 60 High Street Hampton Wick Kingston upon Thames Surrey KY1 4DB

Program *The Adventure Builder System* **Type** Utility **Price** £4 95 **Micro** Spectrum **Supplier** Alpha-Omega CRL Group 9 Kings Yard Carpenters Road London E15 2HD

Look like a cheapo version of the *Quill* but it s difficult to say how it compares in terms of performance Tiny instruction booklet packs a lot in but doesn t look suitable for a total novice

Note that to obtain the graphic style adventure as shown on the cassette inlay, you d need to fork out another £2 50 for the *Graphic Aid*

Program *Computer Wordsearch* **Type** Strategy **Price** £6 95 **Micro** Spectrum **Supplier** 21 Ashbourne Way Thatcham Berks RG13 4SJ

Program *Quest of the Golden Orange Peel* **Type** Adventure **Price** £3 99 **Micro** Spectrum **Supplier** Dual Dimension Software Cedarwood, Darkes Lane, Potters Bar Hertfordshire EN6 1DA

Program *Doctor What* **Type** Arcade Adventure **Price** £7 95 **Micro** Spectrum **Supplier** CRL, 9 Kings Yard Carpenters Road London E15 2HD

Program *King s Keep* **Type** Arcade Adventure **Price** £1 99 **Micro** Spectrum **Supplier** Firebird, 74 New Oxford Street London WC1

Program *Future Knight* **Type** Arcade Adventure **Price** £7 95 **Micro** Spectrum **Supplier** Gremlin Graphics Alpha House 10 Carver Street Sheffield S1 4FS

Program *Survivors* **Type** Arcade Strategy **Price** £1 99 **Micro** Spectrum **Supplier** Atlantis Software 20 Station Road, London SE25 5AG

Originality is not something you expect to find in a budget title, but *Survivors* (quite an apt name for Atlantis Software) turns out to have this virtue in bucketfuls

You control three droids in a *Boulderdash* type environment (a hibernation dome damaged by a nuclear war) and your mission is to teleport out the sleepers trapped by rocks etc etc To make things worse there are rogue droids wandering about the place who will do you severe damage on contact

Pretty average so far but the challenge of the thing is the way in which you must combine the abilities of the three droids to complete the mission (7 levels, almost 1000 hibernators – and there s a time limit of about an hour and a half) One droid can burrow through the debris one can push boulders that block the way and the third does the teleporting You manoeuvre one droid at a time changing over by a single key press Simple but very effective This will keep you occupied for hours – it s one of the best budget titles to pass through our hands for weeks so go out and buy it

Program *Cobra* **Type** Arcade **Price** £7 95 **Micro** Spectrum **Supplier** Ocean Software 6 Central Street Manchester M2 5NS

Anyone remember John Otway and Wild Willy Barret (Cor Baby that s really free, etc)? One of their great encore numbers was a song called Headbutts (obscure pop fact No 4352) And there s a lot of headbutting in *Cobra*

Since the film (starring Sylvester Brain Damage Stallone) flopped over here this was never going to be the licensing deal of the century Professional enough in execution it s quite fun for a short while as you give the assembled ruffians the odd Glaswegian kiss, when you re not taking them out with the infamous laser sighted machine gun (which you find hidden inside a beef burger, incidentally) But whether it would hold you long enough to get your eight quids worth is another matter

A great software cover-up

Never judge a book by its cover – this well known saying could equally apply to computer software Games and utilities seem to be getting bigger not the actual content on the tape or the disc just the size of the exterior packaging

There was a time, not so long ago when most software could be purchased in small practical cassette cases ideal for standing on narrow shelves and easy to sort out whenever required

Not any more the trend now is for software companies to bury the actual cassette or disc in a mountain of superfluous cardboard or plastic packaging which can only come under the category of expensive rubbish

Many of these unnecessary packages are the size of an average video cassette so one obvious problem is finding room to store them on your desk or shelves This must be a major headache for a small retailer who has little space to spare

The home user can overcome the problem partially by adopting the solution of keeping a supply of cheap plastic cases to store the software in whilst storing the defunct packaging in a handy garage or loft or somewhere similar

The software might be considered good value for money if the packaging always reflected what was inside, but all too often the package contains only an original cassette or disc and sometimes a slim booklet

On opening such a package it becomes apparent that there is enough space inside to include several cassettes or discs, plus a fairly thick manual and the buyer is left wondering why all this space is vacant

One reason is that the package will also take discs of varying sizes so that the type of box can do for all the different software formats that the company s product may be released on But the majority of games software is still cassette-based and so the cassette still rattles around inside

> *"75 per cent of the software package is usually comprised of empty space"*

If the buyers would pause to consider that 75 per cent of the software package is usually comprised of empty space or worse still polystyrene or some similar sub stance, then they should also consider who is paying for it, and who is benefiting from it

The first point is obvious The buyer pays for the expensive packaging and he/she need only compare software in the budget range with some of the more expensive products to observe the difference in presentation and in price

The second point does not raise any mystery either as the buyer is paying for the expensive packaging then the benefit must be going to the software company or the distributor and the value for money aspect must be viewed with some suspicion

Buyers should beware when considering a purchase it is all too easy to get lulled into a sense of having bought something of value merely because the package looks good It is the content that counts and the package often bears no resemblance to the product inside

Many of the more enlightened retailers will allow prospective buyers to test a product before a purchase is made And this is of course the best method to adopt when buying software So if there is such a dealer within range then it obviously makes sense to go there next time you intend to part with some of your hard earned cash

Large expensive packages may be justified in certain cases where serious software is being sold and the software companies need to include demonstration programs and manuals along with the main program

But games in particular do not need to be packaged in this manner and if sales were made with the option to purchase a game or utility in either a cheap or expensive package then I suspect that most buyers would not want to be involved in the extra cost

Malcolm Serbert

NEXT WEEK

Buyers' guide to software

The last of *Popular*'s Buyers' Guides deals with software We look at the very best of what's available for your machine, whatever your needs

The finest games produced, the ever-increasing selection of budget titles (good reminders for stocking fillers), the indispensable utilities, the essential applications – all will be revealed in the software supplement

Leave your copy of the magazine open at these pages around the house to ensure a trouble-free Christmas

Readers' Poll

This one will run and run the *Popular Readers'* Poll is now in its third year, and gives you the chance to speak up and be counted

Twelve categories for you to vote for your favourites, the best and worst of 1986

The Archers

We reveal who won the prizes in our competition to find some lyrics for the Ambridge folk

Hackers

Our new disassembler is AMAZINGLY powerful!






CAPTURED
Commodore
£9.95 Tape £14.99 Disk
Spectrum & Amstrad versions coming soon!
ACTION
Created by Greve Graphics for American Action AB,

Konami

SHAO-LIN'S ROAD™

'The arcade hit...
...in your home!'





Screen shots from arcade version – home micro versions may differ

mash hit follow up to 'Yie Ar Kung-Fu'

Commodore 64
and
Amstrad versions
coming soon.

Our hero has finally mastered the secret martial art "CHIN'S SHAO-LIN" but is trapped by triad gangs. With kicks and other secret powers, escape from and travel SHAO-LIN'S road to freedom!

OUT NOW ON SPECTRUM!

THE EDGE

Published under licence by The Edge, 36/38 Southampton Street, London WC2.
Tel: (01) 831 1801 TX. 892379.